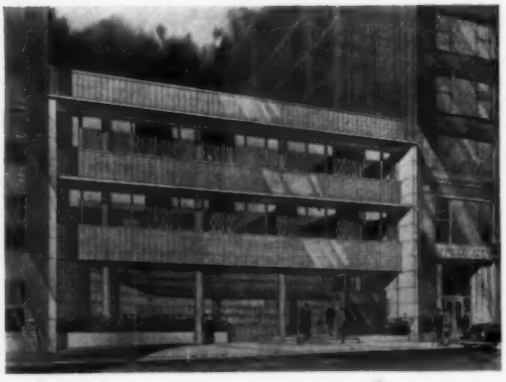
OBSTETRICAL NUMBER

THE JOURNAL OF THE AMERICAN OSTEOPATHIC ASSOCIATION

Vol. 47, No. 11 | 139 N. Clark St., Chicago 2, Ill. | July, 1948



New Headquarters Building Nearly Completed

ONE year ago this month ground was broken for the construction of a permanent home for the American Osteopathic Association. The building is practically completed and Central office will move in around September 1. The new address is 212 East Ohio St., Chicago 11.

Will your name be on the Honor Roll of Builders? There is still time to place it there by sending in your contribution.

This building is to be dedicated to Andrew Taylor Still.

BRAMS on

Treatment of Heart Disease

How to treat every type of heart disease; how to make most effective use of the cardiac drugs; how to adjust dosage in cases with unusual therapeutic response, toxicity, or atypical clinical features; how to appraise surgical risk in cardiac patients; how to treat heart disease when complicated by special conditions—on all these points Dr. Brams gives you clear and immediately usable help. Yes, this brand new book is completely original, soundly authoritative, and literally packed with concise descriptions of effective therapeutic measures that you can use right away in your practice!

By WILLIAM A. BRAMS, M.D., Assistant Professor of Medicine, Northwestern University Medical School. 195 pages, 6"x9", illustrated. $3.50.

WILLIUS & DRY'S

History of the Heart

In his preface, Dr. Donald Balfour calls this new book "delightful reading." You, too, will find it "delightful reading," and a very stimulating experience besides. You cannot help feel a deep pride as you trace the efforts of your predecessors—from antiquity right down to the twentieth century—as they grope painstakingly and often brilliantly through the centuries for the correct anatomical and physiological picture of the heart and circulation. *Interestingly written, beautifully illustrated.*

By FREDRICK A. WILLIUS, M.D., M.S., Senior Consultant in Cardiology, the Mayo Clinic; and THOMAS J. DRY, M.B., M.S., Consultant, Section on Cardiology, the Mayo Clinic. 456 pages, 6"x9", illustrated. $8.00.

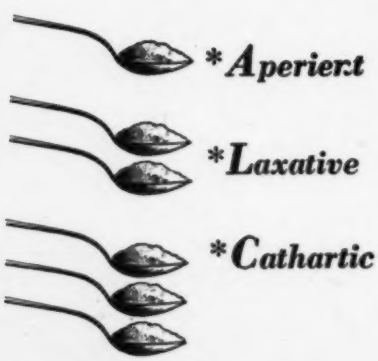
W. B. SAUNDERS COMPANY • **West Washington Square, Philadelphia 5**

easy to administer, pleasant to take

prompt to act

A balanced saline combination which acts by simple osmosis to dilute fecal residue and produce soft fluid bulk . . .

Stimulates peristalsis and promotes *speedy* but *gentle* evacuation.



* *Aperient*

* *Laxative*

* *Cathartic*

* *Average dose*

Product of BRISTOL-MYERS

19 West 50 Street, New York 20, N. Y.

it's New!

65 COTTON BALLS
CAUTION: Sterility of contents is not guaranteed if package has been damaged or previously opened
This product is not sponsored or approved by or in any manner associated or connected with the American National Red Cross
RED CROSS
COTTON BALLS
STERILE
ABSORBENT
Johnson & Johnson
ACTUAL SIZE 1¼" DIAM.

STERILE

CONVENIENT

ABSORBENT

UNIFORM

ECONOMICAL

RED CROSS COTTON
IN A NEW CONVENIENT FORM

FOR applying medication, cleansing wounds, parenteral therapy, pressure dressings, preoperative skin preparation, prehypodermic injection.

COMPACT CARTON OF 65 ready for instant use, convenient in your bag or on office shelf.

RED CROSS

COTTON BALLS

Johnson & Johnson

CONTENTS, JULY, 1948

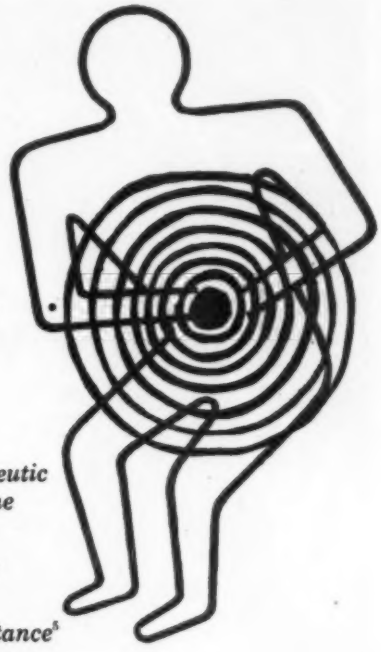
ORIGINAL ARTICLES—
Postural Analysis and Its Relation to Systemic Disease. C. R. Nelson, D.O., Ottawa, Ill.....555
The Halogen Elements in Relation to Autonomic Dysfunction and Degenerative Diseases, Including Cancer. Alexander Levitt, B.S., D.O., Brooklyn.....559
Congenital Torticollis (Wryneck). James M. Eaton, D.O., F.A.C.O.S., Philadelphia.....568
Progress in Surgery of Eye, Ear, Nose, and Throat. Charles A. Blind, D.O., F.A.C.O.S., Los Angeles.....570
EDITORIALS—
Message from the President.....571
Selective Service Act of 1948. C. D. Swope, D.O., Washington, D. C.....571
IV. Summation of Experience with Intervertebral Disk Problems. R. E. Duffell, D.O., Chicago.....571
New Book on Osteopathic Research Now Available. R. E. Duffell, D.O., Chicago.....573
Progress Fund Tops Two Million. Lewis F. Chapman, Chicago.....574
The Job Is Not Finished. Stephen B. Gibbs, D.O., Coral Gables, Fla.....574
Hospital Evaluating Committee Meets.....575
New Osteopathic Research Film to Be Shown at Boston Convention.....575
Seminars on the Osteopathic Lesion Conducted at Kirksville College. Irvin M. Korr, Ph.D., Kirksville, Mo.....575
COMMITTEE ON SPECIAL MEMBERSHIP EFFORT—
Report and Honor Roll.....576-Pr.A
DEPARTMENT OF PUBLIC RELATIONS—
Osteopathic Appointees in VA
Joint Research Program in Medicine and Physical Sciences Announced by the U. S. Atomic Energy Commission and the Office of Naval Research.....576
Tropical Medicine and Malaria.....576
OBSTETRICAL SUPPLEMENT—
Contribution to Osteopathic Literature on Obstetrics and Gynecology. Margaret Jones, D.O., Kansas City, Mo., and Lester Eisenberg, D.O., Philadelphia.....579
The Use of Forceps to Minimize the Stress of the Second Stage of Labor. Delle A. Newman, D.O., Detroit.....580
An Osteopathic Approach to the Treatment of Menstrual Disorders. Julian Lansing Mines, III, D.O., Philadelphia.....582
The Rh Factor in Obstetrics and Pediatrics. Dorothy J. Marsh, D.O., Los Angeles.....586
Discussion. Lionel J. Gorman, D.O., Boston.....589
Abortions. Edna M. Bangs, D.O., Kansas City, Mo.....590
External Cephalic Version in Breech Presentations. A. M. Tuttle, D.O., Bakersfield, Calif.....594
Cervical Lacerations. Roy G. Bubeck, Jr., D.O., Grand Rapids, Mich.....598
Repair of Perineal Lacerations. Arthur B. Funnell, D.O., Denver.....601
Cesarean Section: History, Types, Indications, and Contraindications. Bernard Abel, A.B., D.O., Toledo, Ohio.....604
Symposium: The Toxemias of Pregnancy.....606
BOOK NOTICES.....607
CONVENTIONS AND MEETINGS....ad p. 27
STATE AND NATIONAL BOARDS..ad p. 36
BOOKS RECEIVED.....ad p. 44

AUTHOR AND SUBJECT INDEX

Abel, Bernard:
Cesarean section: history, types, indications, and contraindications.....604-Obst.
Abortions, [Bangs].....590-Obst.
Adhesive plaster, new.....ad p. 38
American College of Osteopathic Obstetricians:
supplement contributed by.....577-Obst.
Bangs, Edna M.:
Abortions.....590-Obst.
Birth rate remains high.....597-Ex.
Blind, Charles A.:
Progress in surgery of eye, ear, nose, and throat.....570*
Book Notices:
Pathogenesis of Visceral Disease Following Vertebral Lesions. Louisa Burns..573-E
Practical Office Gynecology. Karl John Karnaky.....607-BN
Synopsis of Obstetrics. Jennings C. Litzenberg.....607-BN
Congenital Malformations. Douglas P. Murphy.....607-BN
The Rh Factor. Joseph M. Hill and William Dameshek, Eds.....608-BN
George Crile. Grace Crile, Ed.....608-BN
Surgical Pathology. William Boyd.....608-BN
Surgery of the Ambulatory Patient. L. Kraeer Ferguson.....608-BN
Taber's Cyclopedic Medical Dictionary. Clarence Wilbur Taber.....608-BN
Tuberculosis As It Comes and Goes. Edward W. Hayes.....608-BN
A Manual of Fractures and Dislocations. Barbara Bartlett Stimson.....609-BN
Histopathology of the Ear, Nose and Throat. Andrew A. Eggston and Dorothy Wolff.....609-BN
Skin Manifestations of Internal Disorders. Kurt Wiener.....609-BN
Books received.....ad p. 44
Bubeck, Roy G., Jr.:
Cervical lacerations.....598-Obst.
Cancer, halogen elements in relation to, [Levitt].....559*
Cervical lacerations, [Bubeck].....598-Obst.
Cesarean section, [Abel].....604-Obst.
Chapman, Lewis F.:
Progress Fund tops two million.....574-E
Convention, Boston:
President Truman's message.....571-E
Conventions and meetings.....ad p. 27
Degenerative diseases, halogen elements in relation to, [Levitt].....559*
Disease:
systemic, relation of postural analysis, [Nelson].....555*
Dues, A.O.A., the job is not finished, [Gibbs].....574-E
Duffell, R. E.:
New book on osteopathic research now available.....573-E
IV. Summation of experience with intervertebral disk problems.....571-E
Eaton, James M.:
Congenital torticollis (wryneck).....568*
Education, osteopathic, graduate courses offered.....611
Eisenberg, Lester: See Jones, Margaret, jt. author
Examinations: See State and National Boards
Eyes, progress in surgery of, [Blind].....570*
Forceps: See Labor
Funnell, Arthur B.:
Repair of perineal lacerations.....601-Obst.
Gastroscopy film available.....ad p. 42
Gibbs, Stephen B.:
The job is not finished.....574-E
Gorman, Lionel J.:
Discussion: Rh factor in obstetrics and pediatrics.....589-Obst.
Gynecology: See also Menstruation
contribution to osteopathic literature, [Jones and Eisenberg].....579-Obst.
Halogen elements in relation to autonomic dysfunction and degenerative diseases, including cancer, [Levitt].....559*
Hospitals:
osteopathic, Evaluating Committee meets.....575-E
Intervertebral disk, summation of experience with problems, [Duffell].....573-E
Jones, Margaret, and Eisenberg, Lester:
Contribution to osteopathic literature on obstetrics and gynecology.....579-Obst.
Kirksville College of Osteopathy and Surgery, seminars conducted at, [Korr].....575-E
Korr, Irvin M.:
Seminars on the osteopathic lesion conducted at Kirksville College.....575-E
Labor, use of forceps to minimize stress of second stage, [Newman].....580-Obst.
Legal and Legislative:
a matter of history (extract from Congressional Record with relation to Selective Service Act of 1948).....613-Pu.R
Selective Service Act of 1948, [Swope].....571-E
Lesion, Osteopathic:
seminars conducted at Kirksville College, [Korr].....575-E
Levitt, Alexander:
The halogen elements in relation to autonomic dysfunction and degenerative diseases, including cancer.....559*
Marsh, Dorothy J.:
The Rh factor in obstetrics and pediatrics.....586-Obst.
Membership, A.O.A.:
applications.....ad p. 39
changes of address and new locations.....ad p. 40
report and honor roll.....576-Pr.A
the job is not finished, [Gibbs].....574-E
Menstrual disorders, osteopathic approach to treatment, [Mines].....582-Obst.
Mines, Julian Lansing, III:
An osteopathic approach to the treatment of menstrual disorders.....582-Obst.
Nelson, C. R.:
Postural analysis and its relation to systemic disease.....555*
Nervous system, autonomic, halogen elements in relation to dysfunction, [Levitt].....559*
Neuropsychiatric service of Veterans Administration, advances made in....612-Pu.R
Newman, Delle A.:
The use of forceps to minimize the stress of the second stage of labor.....580-Obst.
Obstetrics: See also American College of Osteopathic Obstetricians; Cesarean section; Labor; Pregnancy
cervical lacerations, [Bubeck].....598-Obst.
contributions to osteopathic literature, [Jones and Eisenberg].....579-Obst.
external cephalic version in breech presentations, [Tuttle].....594-Obst.
maternal mortality.....585-Ex.
repair of perineal lacerations, [Funnell].....601-Obst.
Rh factor in, [Marsh]; discussion, [Gorman].....586-Obst.
Osteopathic Progress Fund tops two million, [Chapman].....574-E
Osteopathy: See also Lesion, Osteopathic; Research, Osteopathic; Technic, Osteopathic
a matter of history (extract from Congressional Record with relation to Selective Service Act of 1948).....613-Pu.R
appointees in VA.....576-Pu.R
Otorhinolaryngology, progress in surgery of ear, nose, and throat, [Blind].....570*
Pediatrics:
Rh factor in, [Marsh]; discussion, [Gorman].....586-Obst.
Penicillin, procaine.....ad p. 38
Perineal lacerations, repair, [Funnell].....601-Obst.
Postural analysis and its relation to systemic disease, [Nelson].....555*
Pregnancy: See also Cesarean section: Labor; Obstetrics
toxemias of (symposium).....606-Obst.
President Truman's message.....571-E
Procaine penicillin.....ad p. 38
Research:
joint program in medicine and physical sciences announced by U. S. Atomic Energy Commission and Office of Naval Research.....576-Pu.R
Research, Osteopathic:
new book now available, [Duffell].....573-E
new film to be shown at Boston.....575-E
Rh factor in obstetrics and pediatrics, [Marsh]; discussion, [Gorman].....586-Obst.
Selective Service:
a matter of history (extract from Congressional Record with relation to Selective Service Act of 1948).....613-Pu.R
Act of 1948, [Swope].....571-E
State and National Boards:
Alaska, Colo., Hawaii, Ill., Iowa.....ad p. 36
Kans., Md., Minn., Mont., Nev., N. H., N. Mex., Ore., R. I., Wash., Wis., Alberta.....ad p. 37
examination by National Board.....ad p. 37
re-registration of osteopathic licenses..ad p. 37
Sterilizers, booklet aids buying.....ad p. 38
Swope, C. D.:
Department of Public Relations.....576-Pu.R
Selective Service Act of 1948.....571-E
Technic, Osteopathic:
approach to the treatment of menstrual disorders, [Mines].....582-Obst.
Torticollis, congenital (wryneck), [Eaton].....568*
Toxemias of pregnancy (symposium)..606-Obst.
Tropical medicine and malaria congresses.....576-Pu.R
Tuttle, A. M.:
External cephalic version in breech presentations.....594-Obst.
Ulbrich, A. P.:
Book notices.....609-BN
Version, external cephalic, in breech presentations, [Tuttle].....594-Obst.
Veterans Administration:
advances made in neuropsychiatric services.....612-Pu.R
osteopathic appointees.....576-Pu.R
Wryneck: See Torticollis

Published monthly by the American Osteopathic Association. Office of Publication, 100 S. Kenilworth Ave., Oak Park, Ill. Address all communications to the Main Office at 139 North Clark St., Chicago 2, Ill. Subscriptions $10 a year. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized August 31, 1922. Entered at the Oak Park, Ill., post office as second class matter, April 1, 1926, under the Act of March 3, 1879.

in the management of simple diarrheas



"TOMECTIN"

"TOMECTIN" *is a combination of nickel pectinate and dried fresh tomato pulp, two therapeutic agents which have been found of value in the management of diarrheas of non-specific origin.*

The detoxifying[1, 2] and bacteriostatic[3] properties of nickel pectinate as well as its antihemorrhagic effect[4] have proved of clinical assistance[5] in the treatment of various diarrheal conditions including bacillary dysentery. Morrison reports[6] that with dried tomato pulp, diarrhea from simple or non-organic cause was usually arrested within 24 hours following treatment. Nickel pectinate and dried tomato pulp have been found, in many instances, to bring about a favorable response when other antidiarrheal medication had failed.[5, 6]

"Tomectin" will appeal to infants, children and adults because, dispersed in water, it forms a preparation having the refreshing tartness of tomato juice. From the standpoint of therapeutic effectiveness, simplicity of administration and palatability, "Tomectin" will prove a valuable antidiarrheal medication.

"Tomectin," No. 951, is presented in wide-mouthed bottles each containing 50 grams. Each gram contains:

Nickel pectinate	*150.0 mg.*
Sodium chloride	*50.0 mg.*
Together with all factors naturally present in dried fresh tomato pulp	*800.0 mg.*

[1] Malyoth, G.: Klin. Wchnschr. *13*:51, 1934.
[2] Bittner, J. E., Jr.: Northwest Med. *35*:445 (Dec.) 1936.
[3] Myers, P. B., and Rouse, A. H.: Am. J. Digest. Dis. *7*:39 (Jan.) 1940.
[4] Powers, J. L.: Bull. National Formulary Committee *9*:5 (Oct.) 1940.
[5] Block, L. H., Tarnowski, A., and Green, B. L.: Am. J. Digest. Dis. *6*:96 (Apr.) 1939.
[6] Morrison, L. M.: Am. J. Digest. Dis. *13*:196 (June) 1946.

"TOMECTIN"
Nickel Pectinate Compound

Ayerst

Ayerst, McKenna & Harrison Limited
22 East 40th Street, New York 16, N. Y.

4820

Experience is the Best Teacher

William Withey Gull

(1816-1890)

proved it in pathology

SIR William Gull is medically recognized for his many original observations which led to his classic description of myxedema and a greater understanding of nephritis. He also added much to the fundamental knowledge of neuropathology—such as his observations that locomotor ataxia was a disease of the posterior columns of the spinal cord. Medical knowledge was greatly enriched by Gull's experiences.

Experience is the best teacher in cigarettes, too!

Yes, Experience is what counts—just as it always has. And with millions of smokers who have tried and compared many different brands of cigarettes, Camel is the "choice of experience."

Try Camels! Discover for yourself how the rich, full flavor of Camel's choice, properly aged and expertly blended tobaccos pleases your taste. See if Camel's cool, cool mildness isn't mighty welcome to your throat.

Let your own experience tell you why *more people are smoking Camels than ever before.*

R. J. Reynolds Tobacco Co.
Winston-Salem, N. C.

According to a Nationwide survey:

More Doctors Smoke CAMELS

than any other cigarette

Three independent research organizations in a nationwide survey asked 113,597 doctors what cigarette they smoked. The brand named most was Camel!

immediate symptomatic relief of ocular allergies

ANTISTINE
OPHTHALMIC SOLUTION

THE ONLY ANTIHISTAMINIC EYE DROP NOW AVAILABLE, Antistine Ophthalmic Solution gives almost immediate symptomatic relief of ocular allergies in contrast to the less rapid action of oral antihistaminic therapy. One drop every 3 hours is usually sufficient. Available as 0.5% solution in 15 cc. bottles with dropper.

ANTISTINE IS ALSO AVAILABLE IN TABLET FORM for the systemic treatment of other general allergic symptoms. This new drug has been found effective in patients where another antihistaminic has failed or where side effects have necessitated discontinuation of therapy. Dosage is usually 3 to 4 tablets daily. Available as 100 mg. scored tablets.

• CIBA PHARMACEUTICAL PRODUCTS, INC., SUMMIT, NEW JERSEY

Ciba

ANTISTINE (brand of phenazoline hydrochloride)—T. M. Reg. U. S. Pat. Off. 2/1309M

Tampax solves a problem:

36 × 2 × 365 = 26,280 . . .

In what probably is the most comprehensive clinical study yet made of intravaginal tamponage, an exhaustive check* was made on 42 women over a five-year period—36 of whom inserted Tampax *twice daily for an entire year*, using 730 tampons each, for a grand total of 26,280! . . . As a result of this extraordinarily vigorous application (far exceeding normal periodic use of catamenial tamponage), these—among other—highly significant conclusions are drawn:

1. *Tampons (Tampax) are comfortable and help the psychological attitude toward menstruation.*
2. *Tampons (Tampax) overcome menstrual odor.*
3. *Tampons (Tampax) do not irritate vaginal tissues.*
4. *Tampons (Tampax) do not block the menstrual flow.*
5. *Tampons (Tampax) do not cause cancer, erosion or vaginitis.*

Stemming as they do from a notably detailed series of clinical observations, and amply supported by vaginal biopsies, vaginal pH and glycogen determinations, bacteriologic studies and gross visual and pelvic examinations—these conclusions are strikingly corroborative of the safety, adequacy, comfort and convenience of Tampax!

*West. J. Surg., Obst. & Gyn., 51:150, 1943

. . . and gives a new freedom to the menstruant woman!

TAMPAX

THREE ABSORBENCIES
"Regular", "Super" and "Junior"

TAMPAX INCORPORATED, Palmer, Massachusetts

☐ Send samples and literature, including above clinical study.

☐ Quote prices on Tampax for office use.

*Name*_____
Please Print

*Address*_____

*City*_____ *Zone*____ *State*_____

AOA-78

ACCEPTED FOR ADVERTISING BY THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Good Nutrition Should Start with Breakfast

The long fast from the evening meal to breakfast, and the demands of business and scholastic activities during the morning hours, require that an adequate breakfast be eaten. Yet a significant number of adults and teen age children fail to receive from one-fourth to one-third of their caloric and nutrient needs at breakfast, as recommended by nutrition authorities.

To aid in planning an adequate breakfast, a widely endorsed basic breakfast pattern has been employed. This pattern, consisting of fruit, cereal, milk, bread and butter, serves well as a nucleus around which the morning meal can be built. It is nutritionally sound, as evidenced in the table, and is outstanding in its economy; in the average community, it can be prepared at a cost of but 15 cents.

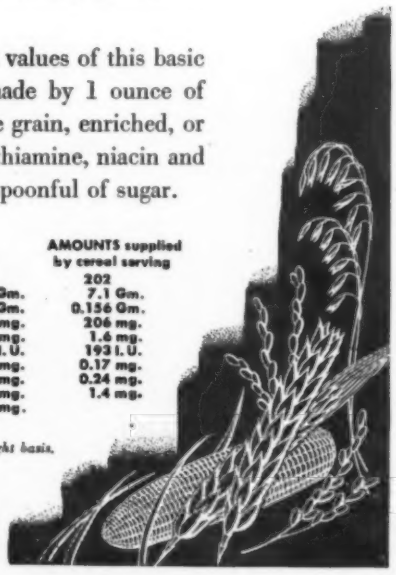
The cereal serving—comprised of hot or ready-to-eat breakfast cereal, milk, and sugar—is an attractive main dish of this meal, contributing excellent nutritional values, taste appeal, and variety.

The table indicates the nutrient values of this basic breakfast and the contribution made by 1 ounce of ready-to-eat or hot cereal* (whole grain, enriched, or restored to whole grain values of thiamine, niacin and iron), 4 ounces of milk and 1 teaspoonful of sugar.

The presence of this seal indicates that all nutritional statements in this advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

BASIC BREAKFAST	TOTALS supplied by Basic Breakfast	AMOUNTS supplied by cereal serving
Orange juice, 4 oz.;	CALORIES..... 611	202
Ready-to-eat or Hot Cereal, 1 oz.;	PROTEIN..... 20.7 Gm.	7.1 Gm.
Whole Milk, 4 oz.;	CALCIUM.....0.465 Gm.	0.156 Gm.
Sugar, 1 teaspoon;	PHOSPHORUS .... 488 mg.	206 mg.
Toast (enriched, white), 2 slices;	IRON ..... 3 mg.	1.6 mg.
Butter, 5 Gm. (about 1 teaspoon);	VITAMIN A..... 1074 I. U.	193 I. U.
Whole Milk, 8 oz.	THIAMINE..... 0.52 mg.	0.17 mg.
	RIBOFLAVIN..... 0.87 mg.	0.24 mg.
	NIACIN ..... 2.3 mg.	1.4 mg.
	ASCORBIC ACID .. 64.8 mg.	

•Composite average of all breakfast cereals on dry weight basis.



CEREAL INSTITUTE, INC.

A research and educational endeavor devoted to the betterment of national nutrition.

135 South La Salle Street • Chicago 3

EXCELLENT SUPPORT for the

PENDULOUS ABDOMEN

Patient with pendulous abdomen (skeleton indrawn).

Same patient after application of support (skeleton indrawn).

CAMP

Clinicians are calling attention to the ill effects of the pendulous abdomen more frequently than formerly.

Research discloses that the increased weight of the abdomen, carrying the center of gravity forward, puts strain on muscles of back and feet; that ultimately round shoulders and increased cervical and lumbar curves develop; that the diaphragm and abdominal viscera lie on a lower plane than normally; that eventually respiratory and circulatory symptoms appear.

S. H. Camp & Company, recognizing this proportionate irregularity and the frequency of its occurrence, has made supports for many years for these obese persons and for those in whom the obesity is largely confined to the abdomen.

Camp surgical fitters are taught to fit patients with pendulous abdomen in the reclining position; thus the intestines are redistributed to the sides and back of the abdomen and the support will hold them there.

The Camp Support illustrated is especially efficient in holding the viscera in their redistributed position by reason of the support given to the pelvis.

S. H. CAMP AND COMPANY • JACKSON, MICHIGAN

World's Largest Manufacturers of Scientific Supports

Offices in New York • Chicago • Windsor, Ontario • London, England

put *Summer Safety* in your formula prescription

Adding cooled boiled water to BIOLAC—as her physician directs—is the only precaution that a vacation-minded mother need take when preparing her infant's formula during the summer months. This simple procedure not only facilitates formula preparation, but also minimizes the possibilities either of contamination under adverse travel or resort conditions, or the chance omission of needed vitamins, carbohydrates or iron. BIOLAC, when supplemented by vitamin C, is a complete infant food. In readily assimilable form, it dependably provides all the essential proteins, vitamins, minerals, carbohydrates and other nutritional factors needed for optimum health.

Biolac dilution is easily calculated—quickly prepared: 1 fl. oz. Biolac to 1½ fl. oz. water per pound of body weight.

Biolac is a liquid modified milk, prepared from whole and skim milk, with added lactose, and fortified with thiamine, concentrates of vitamins A and D from cod liver oil, and iron citrate; only vitamin C supplementation is necessary. Evaporated, homogenized and sterilized. Available in 13 fl. oz. tins at drugstores everywhere.

BORDEN'S PRESCRIPTION PRODUCTS DIVISION
350 MADISON AVENUE, NEW YORK 17, N. Y.

Biolac

"Baby Talk" for a Good Square Meal

Responsibility

The management of human ills by those who practice the healing arts imposes a heavy responsibility. A trust from which they are never relieved.

In providing the profession with products supplemental to the doctor's ministrations Vitaminerals, too, must share this obligation.

"WHERE HEALTH IS CONCERNED THERE CAN BE NO COMPROMISE WITH QUALITY"

For more than fifteen years every Vitamineral product has first met the rigid clinical tests for quality and effectiveness, before its introduction to the profession. This is our continuing pledge to the thousands of practitioners who have placed their trust in the VITAMINERALS name.

PROFESSIONAL LITERATURE ON REQUEST

VITAMINERALS INC.

3636 BEVERLY BLVD., LOS ANGELES 4, CALIFORNIA

Release!

from fear of conception when pregnancy is contraindicated

Physician's package and complete description of the *New Technique* will be sent upon request.

Ethically promoted—Advertised only to the medical profession.

Whenever pregnancy is contraindicated, maximal protection is assured by the new Lanteen technique. This NEW TECHNIQUE gives dual protection—the mechanical protection of the Lanteen Flat Spring Diaphragm plus the spermatocidal activity of Lanteen Jelly.

LANTEEN FLAT SPRING DIAPHRAGM

Easily fitted and long lasting. The Lanteen Flat Spring Diaphragm, collapsible in one plane only, is easily placed without an inserter. Fitting the largest comfortable size assures maximal protection.

Lanteen Diaphragms, made of the finest rubber, are guaranteed against defects for a period of one year.

LANTEEN JELLY

Lanteen Jelly, nonirritating, nontoxic, soothing and rapidly destructive to spermatozoa, combines active spermatocidal agents in a jelly which is readily miscible with the vaginal secretions.

Lanteen

Lanteen Medical Laboratories, Inc. • 900 North Franklin Street • Chicago 10, Illinois

AT HOME OR AWAY SPOT TESTS SIMPLIFY URINALYSIS

NO TEST TUBES • NO MEASURING • NO BOILING

Diabetics welcome "Spot Tests", (ready to use dry reagents), because of the ease and simplicity in using. No test tubes, no boiling, no measuring; just a little powder, a little urine—color reaction occurs at once if sugar or acetone is present.

Galatest FOR DETECTION OF SUGAR IN THE URINE

Acetone Test (DENCO) FOR DETECTION OF ACETONE IN THE URINE

SAME SIMPLE TECHNIQUE FOR BOTH

1. A LITTLE POWDER **2. A LITTLE URINE**

COLOR REACTION IMMEDIATELY

Accepted for advertising in the Journal of the A.M.A.

Write for descriptive literature

A carrying case containing one vial of Acetone Test (Denco) and one vial of Galatest is now available. This is very convenient for the medical bag or for the diabetic patient. The case also contains a medicine dropper and a Galatest color chart. This handy kit or refills of Acetone Test (Denco) and Galatest are obtainable at all prescription pharmacies and surgical supply houses.

Acetone Test (DENCO)... *Galatest*

THE DENVER CHEMICAL MANUFACTURING COMPANY, INC.
163 Varick St., New York 13, N. Y.

SMOOTH APPROACH

In golf, it's not the erratic hard hitters who are tough to beat but the chap who keeps coming up with a consistent smooth approach time after time.

That's why Zymenol is a consistent winner—a smooth approach to effective bowel management without erratic drugs or irritants. Zymenol (1) influences restoration of an aciduric condition favorable to beneficial intestinal bacteria (2) normalizes bowel motility. In a teaspoon dose. Which *is* an advantage.

Zymenol

AN EMULSION WITH BREWERS YEAST

* a product of Otis E. Glidden & Co., Inc.

You get more facilities in less floor space

And each one is available in only a few seconds time. The table can be revolved through 180° from horizontal radiography to horizontal fluoroscopy . . . with little effort.

Styled along modern, functional lines consistent with good taste, the RX offers simple and reliable operation. Locks and controls have been minimized without affecting operating efficiency or radiographic quality.

One tube is used for all x-ray techniques and the RX is furnished with tube capacities to suit your requirements.

Ask your nearest Westinghouse X-ray Office today for facts on the low-cost RX that provides more x-ray facilities in the minimum of space. J-08187

BE SURE TO SEE THE RX GROW

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Electronics at Work

Wintrobe—
Clinical Hematology

By MAXWELL M. WINTROBE, M.D., Ph.D.
Professor of Medicine,
University of Utah School of Medicine
Salt Lake City, Utah

This book is useful and practical because it was written by a clinician for clinicians. It contains only *usable clinical data* that will bring you up-to-date on the most current advances in the field of hematology. Throughout the book, emphasis is placed on the importance of diagnosis as a prerequisite to effective treatment. Diagnostic and therapeutic measures are then given in full detail. Methods are presented so clearly and simply that the recommended tests may be performed in your own office with perfect confidence.

Second Edition. 862 Pages, 197 Illustrations and 14 Plates, 10 in Color. $11.00.

Joslin—Treatment of
Diabetes Mellitus

By ELLIOTT P. JOSLIN, M.D.
Clinical Professor of Medicine Emeritus, Harvard Medical School; Medical Director, Baker Clinic, New England Deaconess Hospital.
AND ASSOCIATES

The eighth edition of this classic work reflects the experience of its authors in the treatment of more than 29,000 diabetics and glycosurics. Diabetes as it is seen today is pictured clearly. The simple methods which any physician may use with success in his office cases are described. Plans to be followed with ambulatory cases cared for in a nursing home are presented, while experiences with patients developing complications which require investigation and treatment under hospital conditions are reported. Written by an unquestioned authority.

Eighth Edition. 861 Pages. Illustrated. $10.00.

Washington Square **LEA & FEBIGER** Philadelphia 6, Pa.

Official Automobile Emblem

Now Available

First shipment since pre-war days. Ready for immediate delivery.

Design, consisting of green cross and gold lettering on white background, is executed in best quality baked enamel on a heavy bronze convex shield. Washable and weather-proof.

Fitted with steel bracket for attachment to license plate holder.

Recognized by many local and state police departments.

Supplied only to members of the American Osteopathic Association.

Price $1.50, Postpaid

American Osteopathic Association

139 N. Clark Street **Chicago 2, Illinois**

RIASOL
Rings the bell in PSORIASIS

The problem of psoriasis is being solved with RIASOL. That this effective, therapeutic agent "rings the bell," in what has long been a baffling skin condition, is conceded by thousands of doctors who now prescribe it.

RIASOL provides a means whereby disfiguring psoriatic lesions clear up promptly in most instances. The number of recurrences is often reduced.

Patients like RIASOL. With fading and gradual disappearance of the ugly scales, there is cosmetic relief and mental assurance. RIASOL is so simple, pleasant and convenient to use that patient cooperation is assured.

RIASOL contains 0.45% mercury chemically combined with soaps, 0.5% phenol and 0.75% cresol in a washable, non-staining, odorless vehicle.

Apply daily after a mild soap bath and thorough drying. A thin, invisible, economical film suffices. No bandages necessary. After a week, adjust to patient's progress.

RIASOL is ethically promoted. Supplied in 4 and 8 fld. oz. bottles, at pharmacies or direct.

SPECIAL NOTICE

New 64-page brochure on psoriasis has been mailed to all physicians. Write for a copy if you did not receive yours.

BEFORE USE OF RIASOL

AFTER USE OF RIASOL

SHIELD LABORATORIES A.O.A. 7-48
8751 Grand River Ave., Detroit 4, Mich.

Please send me professional literature and generous clinical package of RIASOL.

..... M.D. ..... Street

City..... Zone..... State.....

Druggist..... Address.....

MAIL COUPON TODAY— PROVE RIASOL YOURSELF

RIASOL for PSORIASIS

Restoration of function can be accomplished in most arthritic patients by a complete systemic rehabilitation program. Darthronol is an integral part of such a therapeutic program. Its efficacy is due to the antiarthritic effects of the high dosage vitamin D together with the well-established nutritional influences of the eight other vitamins. Darthronol treats the arthritic —not merely the arthritis.

DARTHRONOL

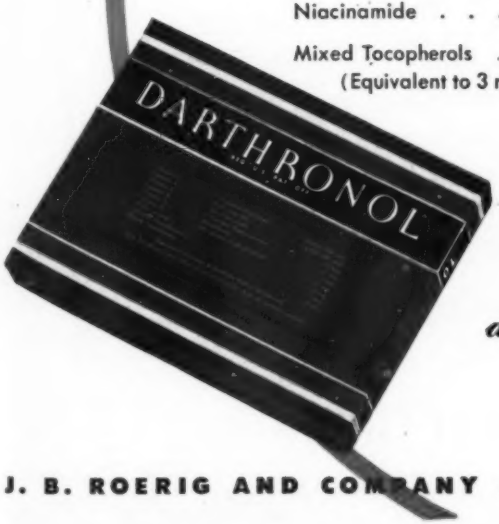
for the Arthritic

SYSTEMIC REHABILITATION

EACH CAPSULE CONTAINS

Vitamin D (Irradiated Ergosterol)	50,000 U.S.P. Units
Vitamin A (Fish-Liver Oil)	5,000 U.S.P. Units
Ascorbic Acid	75 mg.
Thiamine Hydrochloride	3 mg.
Riboflavin	2 mg.
Pyridoxine Hydrochloride	0.3 mg.
Calcium Pantothenate	1 mg.
Niacinamide	15 mg.
Mixed Tocopherols	4 mg.

(Equivalent to 3 mg. of synthetic Alpha Tocopherol)



a **ROERIG** *preparation*

J. B. ROERIG AND COMPANY • 536 Lake Shore Drive • Chicago 11, Illinois

"A Suture for Every Surgical Situation"

For nearly forty years Davis & Geck, Inc., has specialized exclusively in the development and manufacture of sutures. As a result the D&G line is so complete that it includes a suture of known standard and predictable behavior for every surgical need. D&G sutures are obtainable through dealers everywhere.

DAVIS & GECK, INC.

57 Willoughby Street Brooklyn 1, New York

ACTIVE INGREDIENTS
Zinc Chloride - Menthol
Formaldehyde - Saccharine
Oil Cinnamon - Oil Cloves
Alcohol 5%

RATIONAL MOUTH HYGIENE

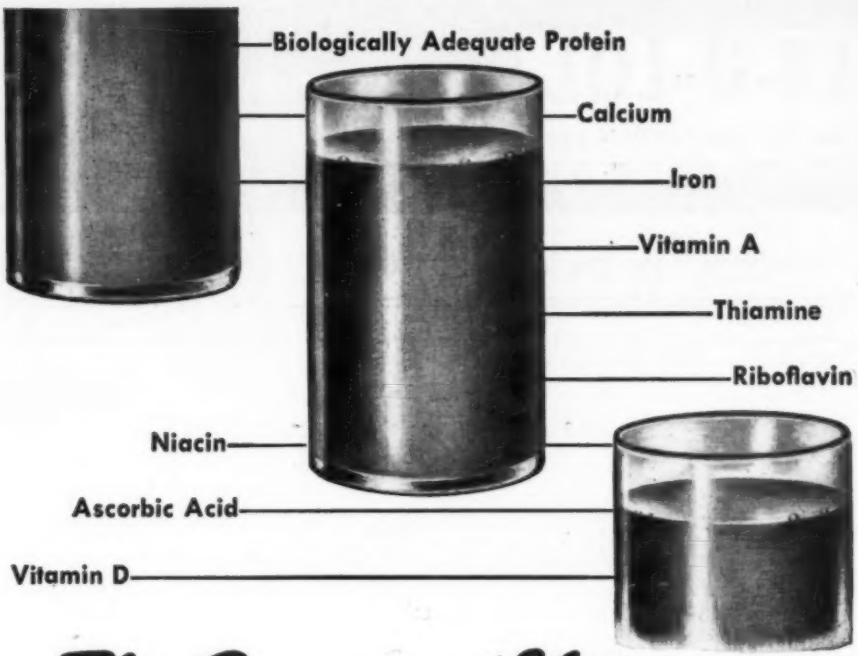
We do not claim that Lavoris will kill all the bacteria in the mouth and throat. But it will coagulate, detach and flush out the adherent mucus accumulations and fermenting debris and thereby largely remove the culture media in and upon which oral bacteria thrive.

Furthermore, its invigorating astringent action will improve the tone and resistance of the tissues, which is the best defense against bacterial invasion.

LAVORIS
MOUTHWASH AND GARGLE
REG. U.S. PAT. OFF.

FOR MOUTHCARE

Effective — Safe — Pleasant



The Gamut of Nutrients

When the need for dietary supplementation arises, the delicious food drink made by mixing Ovaltine with milk finds wide application. This dietary supplement provides generously of all the nutrients considered necessary, in balanced proportion for optimal utilization. Three glassfuls daily, in conjunction with even an average diet, raises the intake of essential nutrients to optimal levels.

Its appealing taste and easy digestibility virtually assure patient acceptance, as well as consumption of the recommended three glassfuls daily.

Ovaltine finds valuable use pre- and postoperatively, following recovery from infectious disease, in pregnancy and lactation, in pediatrics in the management of food-resistant children with finicky appetites, and to supplement restricted dietaries whether prescribed or self-imposed as a result of food aversions and idiosyncrasies.

THE WANDER COMPANY, 360 N. MICHIGAN AVE., CHICAGO 1, ILL.

Ovaltine

Three servings daily of Ovaltine, each made of ½ oz. of Ovaltine and 8 oz. of whole milk,* provide:

CALORIES	669	VITAMIN A	3000 I.U.
PROTEIN	32.1 Gm.	VITAMIN B_1	1.16 mg.
FAT	31.5 Gm.	RIBOFLAVIN	2.00 mg.
CARBOHYDRATE	64.8 Gm.	NIACIN	6.8 mg.
CALCIUM	1.12 Gm.	VITAMIN C	30.0 mg.
PHOSPHORUS	0.94 Gm.	VITAMIN D	417 I.U.
IRON	12.0 mg.	COPPER	0.50 mg.

*Based on average reported values for milk.

BET-U-LOL
HUXLEY PHARMACEUTICALS
521 FIFTH AVENUE, NEW YORK, N. Y.

The Ethical Topical Anodyne that Controls . . . PAIN *in muscle, nerve and joint inflammations*
CONTAINS CHLORAL HYDRATE • MENTHOL METHYL SALICYLATE

SEND FOR A PHYSICIAN'S SAMPLE OF OUR
PROTEIN DIGEST No. 26

Sidamine Tablets

the amino acid tablet—uncoated—but carrying 70% protein, no dextrose or other carbohydrate filler.

In writing for samples, please give your degree

Professional Foods
Cedar Rapids, Iowa

COLCIN PAN-ENZYMES NORMIN

TECA OUTSTANDING IN EFFICIENCY • APPEARANCE • DURABILITY

LOW-VOLT and HYDROGALVANIC GENERATORS

Specializing in the Manufacture of Electrotherapeutic Apparatus

For Information, Write: **TECA CORPORATION, 220 W. 42 St., New York 18, N.Y.**

"Diarrhea and Dysentery are no problem now"

Cereal Lactic, a natural cereal product, high in lactic acid content, rich in enzymes, minerals and vitamins, is more than an emergency treatment for Diarrhea and Dysentery. While it usually affords prompt relief, it also helps sustain the healthy condition of the gastro-intestinal tract.

Thousands of physicians say: "I know of no other product that has brought results as quickly and thoroughly in treating Diarrhea and Dysentery and other gastro-intestinal disorders." Physicians' samples, including complete information, available on request.

CEREAL LACTIC

Two Forms: "IMPROVED VITAMIN" and "ANTACID AND ADSORBENT"

Widely prescribed by the profession as an effective treatment for Gastro-Intestinal disorders.

CEREAL LACTIC COMPANY
Woodward, Iowa

The only Mercurial with time-saving hook-type cuff

IT'S TRUE! The new 1948 Tycos Mercurial comes standard equipped with the famous Tycos Hook-Type Cuff which fits easily into the light cast-aluminum case. The cuff's 16 adjustments fit any size arm instantly. No ballooning or unequal compression to throw your readings off.

What's more, your new Tycos Mercurial has the glass tube recessed to protect it from breakage. Easy-to-read embossed numerals on gun metal-finished scale. Overflow trap prevents spilling when glass tube is removed for cleaning. *Note: complete instrument (except inflation system) is guaranteed against breakage for ten years.* Guaranteed to remain accurate *indefinitely* if properly used.

Only **$36.50,** complete with Hook-Type Cuff. See it at your surgical supply dealer's today—along with the convenient Tycos Aneroid in pocket-sized zipper case. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

YOUR INITIALS . . .
Your surgical supply dealer will personalize your new Tycos Mercurial with gold-plated initials without charge at time of sale.

Die-cast aluminum case guaranteed against breakage for 10 years.

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

CONTURA *and*
Reg. U. S. Pat. Off.

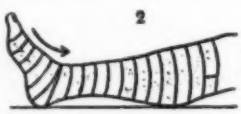
PRESSOPLAST
Reg. U. S. Pat. Off.

The Combination Pressure Bandage
(Pat. Applied For)

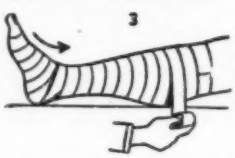
In the Treatment of LEG ULCERS AND ECZEMAS

1. Apply moist Contura bandage loosely. Contura makes shaving unnecessary.
2. Apply 3" wide Elastic Adhesive Pressoplast bandage over Contura bandage with firm but non-constricting pressure, starting at the base of the toes and wrapping the bandage up to the knee. (See illustration.)
3. Always bandage the leg from toes to knee.

1. Protect instep, Achilles tendon and region directly below knee with gauze spread with vaseline.



2. Apply Contura bandage loosely.



3. Apply Pressoplast bandage over Contura bandage with firm but non-constricting pressure.

4. The treatment is ambulatory. Walking increases the action of the bandage.
5. Change the bandage when it becomes loose. The first few bandages may require frequent changing, especially if there is a pronounced swelling at the start of the treatment.
6. To remove bandage, simply cut the entire length. The Contura bandage will have prevented the adhesive film on the Pressoplast bandage from adhering to the leg.
7. In the after treatment of leg infections, it is recommended that the leg be adequately supported with a 3" wide "PRESSO" BANDAGE (Cotton Elastic with Rayon—non-adhesive).

Write for detailed literature

MF INC.

MEDICAL FABRICS, Inc.
10 Mill Street **Paterson 1, N. J.**

Welcome Relief

in POISON IVY DERMATITIS

The tormenting itch of Rhus dermatitis has few equals in routine medical practice. Many patients receive early, welcome relief after injections of POISON IVY EXTRACT Arlington.

POISON IVY EXTRACT Arlington is an absolute alcohol extract of Rhus leaves of established potency. The use of absolute alcohol results in an extract of greater dependability. Use as supplied for diagnostic patch test and for treatment of poison ivy dermatitis.

Clinical evidence indicates that a single excitant is responsible for dermatitis due to poison ivy, poison oak, and poison sumac. Thus, this extract is equally applicable to dermatitis caused by contact with any of these plants.

DOSAGE: As soon as possible after appearance of symptoms, three subcutaneous injections of 0.1 cc. each are given at daily intervals.

POISON IVY EXTRACT

Arlington

SUPPLIED in rubber-stoppered vials containing 3 cc.

THE ARLINGTON CHEMICAL COMPANY

YONKERS 1 Arlington NEW YORK

Bind Your A.O.A. Journals for Ready Reference

Handsome black fabricoid leather binders made specially to hold 12 issues of the A.O.A. Journal. *Name of Journal stamped in gold on back.* Will last a lifetime.

Easy to Operate
No Punching Necessary
Each $3.00 Postpaid

American Osteopathic Association
139 N. Clark St. Chicago 2, Illinois

The Spinalator
REGISTERED U.S. PATENT OFFICE

The Spinalator is more than a treatment table, more than a mechanical aid, more than an ordinary modality. It is the attainment of a long sought objective, the result of many minds working to a common end, viz.: an instrument of beauty and durability that will perform 80% of the work in a general manipulative treatment and do it better than if it had been done by hand.

Write today for full details.

THE SPINALATOR COMPANY
P. O. Box 826 Asheville, N.C.

Favorite With All Physicians!

KRUSE Utility Kits

Made of genuine cow-hide leather, with water-proof lining, KRUSE utility kits answer every physician's need for a small bag to hold special instrument units, syringes, dressing, etc.

No. 10	10" x 3¾" x 5"
No. 12	12" x 4¼" x 5½"
No. 12 W. H.	12" x 4¼" x 5½"
No. 14 W. H.	14" x 5¼" x 6½"

Kruse Utility Kits come in three convenient sizes to fit your special requirements, can be carried under arm or equipped with handles. Write for the name of your nearest dealer.

G. KRUSE & CO. 800 McCARTER HIGHWAY NEWARK 5, NEW JERSEY

Initial Introduction at the A.O.A. Convention
Scientifically Designed Bedding

The SACRO-REST Mattress
2 distinct mattresses in 1 unit

SACRO-REST with its double-feature construction assures restful sleep and progressive relief for those suffering from vertebral disturbances.

1. The Sacro-Rest side, with its hidden board construction and resilient felt pad, gives level, controlled support and correct sleeping posture while a vertebral condition is acute.
2. The opposite or posture-controlled side, with its steel springs, evenly secured to the board, is perfect for use when modified support for the back is still advisable. This side is perfect for anyone preferring luxurious, firm, controlled sleeping comfort.

**Sacro-Rest level of support.*
***Level of support given by ordinary mattresses*

THE BABY-FORM crib mattress is the same in design and construction as the Sacro-Rest, offering baby correct posture support during the important first years of development.

Both available at better department stores. Write for name of the store nearest you.

SACRO-REST & BABY-FORM *Mattresses*
Patent Pend.

SEE OUR DISPLAY at BOOTH 11

Manufactured by
THE CHAS. A. MAISH CO.
Cincinnati, Ohio

"Since 1878 — the oldest name in fine bedding"

REMOVAL-CLEARANCE SALE

Surplus quantities of literature are being offered at greatly reduced prices for a limited time in order to cut inventories in preparation for moving to the Association's new building.

- Orders may be made up of assorted issues in any quantities desired, at prorated prices.
- Stocks are very limited on some items. Give alternative choices if issues ordered are sold.
- Prices include transportation anywhere in U. S. and Canada.
- Mailing envelopes not included. Will be sent if ordered at 50 cents per 100.
- No imprinting orders accepted. (Use rubber name stamp.)
- *Lists of contents* in these back numbers will be sent on request.
- Samples of selected numbers sent at following rates: O.M. at 3 cents each; O.H. (either style) at 2 cents each; Kenny Booklet for 3 cents.

Back Issues of Osteopathic Magazine

Issues from 1940 through 1947 at $3.00 per 100.
Issues of 1948 up to the current month at $5.00 per 100.

Back Issues of Osteopathic Health

Earlier Style: Undated issues of the O.H. when it was a 24-page booklet, $2.00 per 100.

Later Style: Undated copies of the newer style 8-page leaflet dealing with specific subjects, $1.50 per 100.

Osteopathy and the Kenny Method of Treating Infantile Paralysis

The polio season will soon be here. Get ready for it by having a supply of these booklets ready for distribution. This 22-page booklet regularly sells for $5.00 per 100. It is offered for the period of the sale for $3.00 per 100.

Legal Liabilities of the Physician and Surgeon—*By Raymond Nettleship*

48 pages. Paper cover. Originally sold for $1.00, now 15 cents.

Cells of the Blood—*By Louisa Burns, M.S., D.O.*

410 pages. 14 color plates. Cloth binding. 1931. Formerly $8.00, now $1.50.

Research Bulletin No. 6 *"Growth Changes Due to Vertebral Lesions"*

By Louisa Burns, M.S., D.O., and Associates. 124 pages. Paper cover. 1915. Formerly $4.00, now 25 cents postpaid.

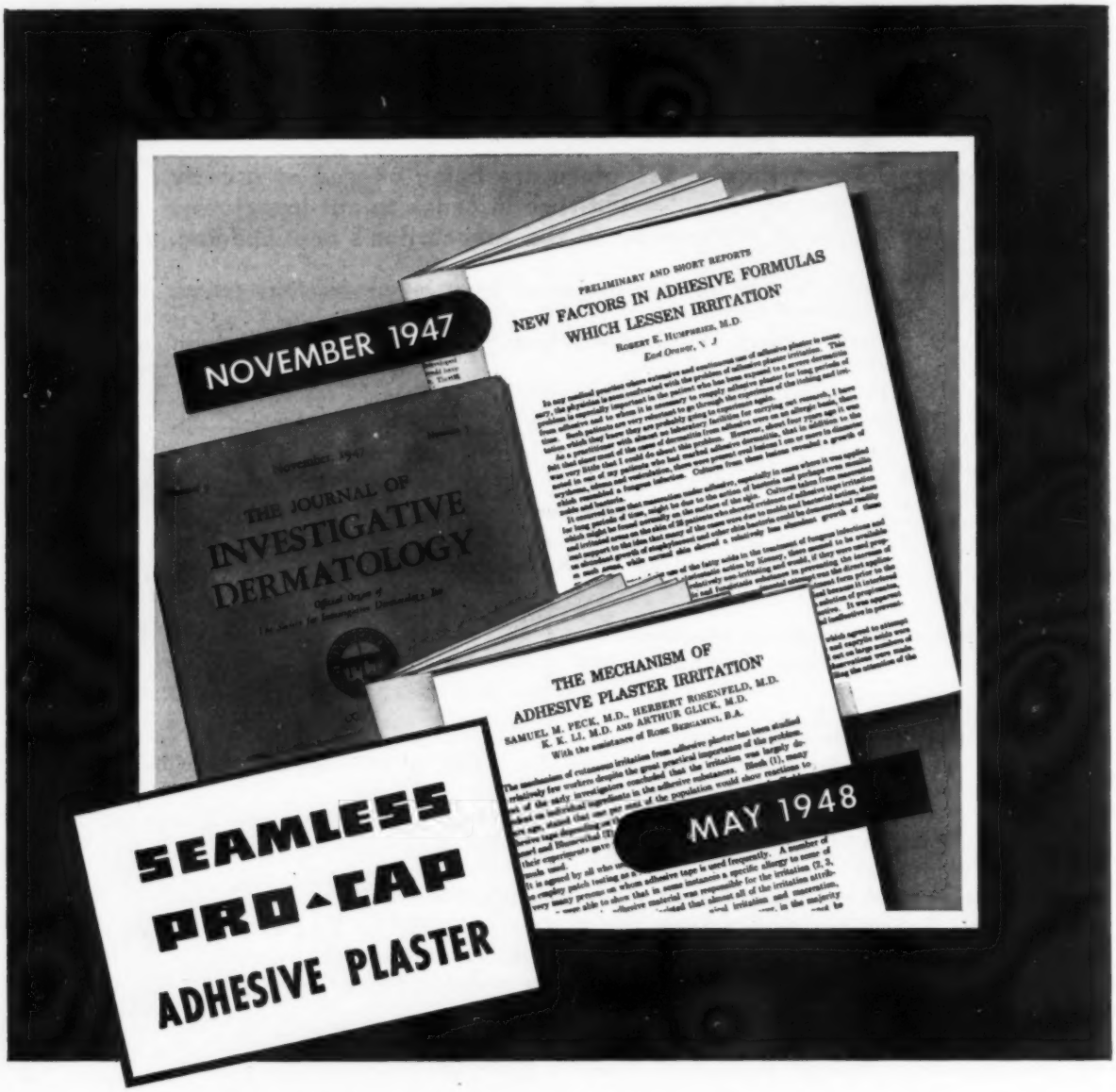
The Intervertebral Discs—*By Ormond A. Beadle*

Observations on their Normal and Morbid Anatomy in Relation to Certain Spinal Deformities. 96 pages. Reprinted 1946. Paper binding, $1.00. Cloth $1.50.

Stock up NOW for the months ahead

American Osteopathic Association

139 North Clark St. Chicago 2, Illinois


NOVEMBER 1947
PRELIMINARY AND SHORT REPORTS
NEW FACTORS IN ADHESIVE FORMULAS WHICH LESSEN IRRITATION
ROBERT E. HUMPHRIES, M.D.
THE JOURNAL OF INVESTIGATIVE DERMATOLOGY
THE MECHANISM OF ADHESIVE PLASTER IRRITATION
SAMUEL M. PECK, M.D., HERBERT ROSENFELD, M.D.
K. K. LI, M.D. AND ARTHUR GLICK, M.D.
MAY 1948
SEAMLESS
PRO-CAP
ADHESIVE PLASTER

CLINICAL PROOF OF LESS IRRITATION

"The addition of zinc salts of propionic and caprylic acids to adhesive tape formula (a) caused better adhesion, (b) less pruritus, (c) a marked reduction in adhesive tape dermatitis and (d) less skin maceration."
—R. E. Humphries, M.D.

"The adhesive tape containing the fatty acid salts showed much less tendency to produce irritation . . . tended to adhere more closely . . . when it was removed, it did not have a slimy deposit on its under surface."
—S. M. Peck, M.D., et al

SEAMLESS PRO-CAP is the *only* adhesive plaster that contains fatty acid salts. Less irritating! Adheres better! *The answer to your adhesive problems!* Available through leading hospital and surgical supply dealers. Write today for complete, documented brochure.

FINEST QUALITY SINCE 1877

SURGICAL DRESSINGS DIVISION
THE SEAMLESS RUBBER COMPANY
NEW HAVEN 3, CONN., U. S. A.

REG. U.S. PAT. OFF.
SEAMLESS

The Journal of the American Osteopathic Association

PUBLISHED MONTHLY BY THE AMERICAN OSTEOPATHIC ASSOCIATION

Vol. 47, No. 11 | 139 N. Clark St., Chicago 2, Ill. | July, 1948

COPYRIGHT, 1948, BY AMERICAN OSTEOPATHIC ASSOCIATION

Postural Analysis and Its Relation to Systemic Disease*

C. R. NELSON, D.O.
Ottawa, Ill.

The object of this paper is to present an approach to the problems of disease, an approach so specifically osteopathic in its bases as to be virtually exclusive for those who comprehend the osteopathic concept of disease and health.

The word "posture" has a variety of meanings, the variations depending upon the context. The definition in Webster's New International Dictionary is: "Relative arrangement of the different parts of anything, especially of the parts of the body; the position or bearing of the body as a whole, whether characteristic or assumed for a special purpose." For our purpose here, however, we must be more specific and somewhat more restrictive in defining posture, in order to bring to mind essential reasons for its consideration as an entity in osteopathic analysis. Thus for the purpose of this paper, we shall define posture as the total reaction of the body to fundamental forces, chiefly that of gravity, whatever the position of the body. The word "reaction" as used here means the total reaction of the body and not that of the musculoskeletal system only.

With this definition before us, let us propound a question as to the significance of posture and by an examination of osteopathic fundamentals, answer that question clearly and definitely. The question would be something like this: "Is posture a significant factor in the cause and treatment of disease?" To rationalize a bit, we may say that since, in the osteopathic concept, we link pathological evidence with osteopathic lesions, if posture can be demonstrated as producing or maintaining osteopathic lesions, then surely it is a basic factor in the cause of disease. If this be true, then conversely, if adequate treatment involves the removal of osteopathic lesions, we must consider posture in any therapeutic regime. Let us see what an examination of osteopathic fundamental principles will reveal.

HISTORY

In reviewing osteopathic fundamental principles, it seems fitting to mention briefly the historical development of those principles, which will indicate the slow sureness of each step as well as the time-tested soundness of the broad base upon which all osteopathic progress rests. Although the following list is by no means all-inclusive, I choose to call each item an osteopathic milestone:

1. In 1874 Andrew Taylor Still[1] stated the fundamental principle of osteopathy that perverted structure was related to perverted function.

2. In 1918 Fryette[2] related the laws of physiological movements of the spine to the osteopathic concept.

3. In 1921 Schwab[3] and Hoskins[4] introduced the technic of standing pelvic x-ray studies to include balance factors in diagnosis, and reports of their findings were published in THE JOURNAL OF THE AMERICAN OSTEOPATHIC ASSOCIATION beginning in January, 1932.

4. In 1930 Sutherland[5] stated the cranial bowl concept and declared it related to body balance.

5. In 1941 Denslow and Clough[6] reported on electromyographic studies of structural abnormalities.

Incomplete though this list is, it demonstrates conclusively that although its fundamental principles and precepts remain unchanged, the science of osteopathy is by no means the static idea that some would have us believe, but like all great truths, is dynamic and grows consistently by the sheer weight of its own merit. Osteopathy is a relatively young science; the progress indicated by these milestones has been made in the span of a single lifetime.

Let us contrast with this what the so-called old school of medicine has accomplished in the search for basic causes of disease. As long ago as 1830, Teale[7] wrote: "I find that tenderness along the spine will correspond to symptoms in nervous afflictions." Likewise, in 1834 the Griffin[8] brothers, physicians, pointed out that: "Spinal tenderness is so constant and so acute diagnostically, it is remarkable that it should have been overlooked so long." It is almost inconceivable that the dominant school of practice, always vociferous in its claims to therapeutic progress, could have so unreasonably and so stubbornly neglected any research along this important avenue of diagnosis and treatment.

To complete the list of similar references in medical history would consume too much time here. Let it suffice to state that in 1842, Riadore[9] predicted a lengthening catalog of diseases from spinal irritations, curvatures, etc. More than a century has passed and we have barely completed page one of such a compilation. Volumes have been written about the effects upon the health of the human organism of such physical agents as heat, cold, relative humidity, and mechanical,

*Presented before the General Sessions, Fifty-First Annual Convention of the American Osteopathic Association, Chicago, July 21, 1947.

electrical, and radiant energy; but who has more than alluded to the tremendous force of gravity, never ceasing and destructive to man?

PHYSIOLOGICAL MOVEMENTS OF THE SPINE

In reviewing fundamental osteopathic principles, it would seem appropriate to begin with a consideration of the basic entity of the osteopathic lesion. Definitions of the osteopathic lesion are manifold. You have all heard and read so many supposedly all-inclusive definitions, that it has been said that the expression is not accurately definable. Of course, it is definable and very accurately, but such a definition would necessarily be long in order to include all the various types of osteopathic lesions. Thus for our purposes here, let us consider one characteristic common to all definitions, namely that of aberration of motion. With specific reference to joint structures, it can be said that all osteopathic lesions involve changes in normal motion or mobility. It is important to emphasize this point as the neurological component of the osteopathic lesion seems to be dependent, one might say almost proportionally to the extent of change in normal motion. It must be pointed out also that conversely, wherever changes in range of motion occur, we have osteopathic lesions.

All motion of which joint structures are capable may be divided into four types. These types of motion are flexion, extension, rotation, and lateral flexion (sidebending). The normal range of each of these classifications of motion varies considerably in the different joint structures throughout the body. Since we are here concerned chiefly with the balance factors of body posture, we shall confine our consideration of joint motion to spinal structures. As a result, we have one more joint condition to describe. When a spinal joint is in what we might loosely term a "neutral" position, that is, when it has a normal range of each of the above physiological movements remaining to it, we say that it is in "easy normal." Another way of describing the condition is that the joint is in a position in which no bending moment is being applied to it about any axis. In general, the usual standing position of the normal human way be denoted as "easy normal."

An important consideration frequently overlooked is that in spinal joint structures, all physiological movements have a specific relationship with one another. The simplest example of this is that rotation and lateral flexion always occur together as complementary motions, although in varying degrees of each type in different areas of the spine. This is made necessary by the physical makeup of spinal segments and the size, shape, and position of facets. Likewise, other types of physiological motion occur under definite conditions and so specifically that two laws of physiological movements of the spine can be stated. The principles of these two laws should be kept in mind as they constitute the key to the relationship of posture to health or disease. They are:

First Law.—When any area of the spinal column is in the easy normal position and lateroflexion is introduced, rotation of the vertebral bodies occurs into the convexity of the curve thus produced. The movements occur in the order named, i.e., easy normal, lateroflexion, rotation.[10]

Second Law.—When any area of the spine is in either marked flexion or marked extension, lateroflexion and rotation when introduced occur to the same side and are coexistent and complementary. Rotation occurs into the concavity of the curve and probably precedes lateroflexion to a slight degree and for this reason it is said that these movements occur in the following order: flexion or extension, rotation, lateroflexion.[10]

In the event you deem these two laws of spinal motion as of only theoretical significance, it should be pointed out that each has very definite diagnostic palpatory findings which all of you have elicited upon examination many times. Because of their frequency, let us list these findings. Since in any spinal motion involving lateral flexion we have a convex and a concave side, we will give the findings on each of these sides separately.

FIRST LAW

On the Convexity.—
Superficial tissue tension and tenderness
Deep tissue tension and tenderness
Spinous processes separated and in the convexity
Transverse processes separated and posterior
Facet motion restricted
On the Concavity.—
Transverse processes approximated
Facet motion relatively free

SECOND LAW

On the Convexity.—
Superficial tissue tension and tenderness
Spinous processes in the convexity, either approximated or separated
Transverse processes separated
Facet motion comparatively free
On the Concavity.—
Deep tissue tension and tenderness
Transverse processes approximated and posterior
Facet motion severely restricted

A little study of the foregoing relationships will indicate that they are dependent upon a broad principle of spinal motion which may be stated as follows: Whenever a spinal joint has traversed any portion of the normal range of one or more of its physiological motions, all other physiological movement is restricted.

This law can be very easily demonstrated by comparing the range of flexion, for instance, first from a position of easy normal and then from a position of lateral flexion and rotation. It will be immediately obvious that the range of flexion from the latter position is restricted considerably.

With these facts about joint motion in mind, let us see what effect body posture may have on either the production or maintenance of osteopathic lesions. We will begin with the common garden variety of sacroiliac lesion seen every day in osteopathic physicians' offices. This type of lesion involves movement beyond the physiological limit of the sacrum upon either ilium in flexion, lateral flexion, and rotation. Accordingly, the top of the sacrum is tilted away from the horizontal toward either side and usually slightly anteriorly. Since the top of the sacrum is the base of support for the spinal column, any change in this base of support necessitates a corresponding change in the spinal column in order to maintain its balance. Both the automatic balance function of the semicircular canals in the head and postural reflexes of large somatic muscles operate to produce this compensatory change. Let us assume that the sacrum has flexed, laterally flexed, and rotated to the left. The compensatory mechanism which operates immediately will exert lateral flexion toward the opposite side and we then have the application of the First Law of physiological movement of the spine. In this example the situation would then be that the

sacrum would be tilted anteriorly and to the left while the lumbar segments would be laterally flexed to the right and rotated to the left. Depending upon the extent of these changes and the condition of the spinal structures in which they occurred, a whole galaxy of further compensatory changes may take place in spinal joints above the lumbar area.

Now, to go back for a moment to our laws of physiological movement, whenever a joint has traversed any portion of the normal range of one or more of its physiological motions, all other physiological movement is restricted. Accordingly, since in this example the lumbar spinal segments have been laterally flexed right and rotated left, all other physiological movement is restricted. Most important of all, since they now have an aberration of motion, they are in lesion. Likewise, all higher spinal segments that take part in any compensatory change are involved in alterations of their normal ranges of motion and thus are also in lesion. It is true, of course, that symptoms are not commonly elicited from such higher lesions, particularly in acute sacroiliac disorders, but for the moment we are not concerned with such symptoms, but rather with what actually takes place in osteopathic mechanics.

Let me call your attention to the fact that all of these compensatory spinal changes have occurred in response to the demands of gravity. They have occurred as a result of the body's continuous battle against gravity, a battle carried on even in the face of often severe mechanical disadvantage.

If such extensive changes are the result of the action of gravity upon the body in such a relatively simple deviation of normal balance as a sacroiliac lesion, consider for a moment the tremendous influence of gravity upon all those who are not in perfect balance, not as a result of sacroiliac lesions, but from the host of causes for postural imbalance. Consider also that perfect balance is a rarity among modern human beings, a situation being made worse every day by the trend toward soft easy chairs, innerspring mattresses, and a variety of other accoutrements of recent design for easy living, distributed with reckless disregard of the total effect upon human health. With the base of support of the spinal column already pitched to one side or the other, as it were, it is obvious that in the vast majority of people we are already confronted with whole groups of osteopathic lesions, produced and maintained by the response of the body in imperfect balance to the forces of gravity and in accordance with the laws of physiological movements of the spine.

The etiology of postural deviations would constitute an enormous list of causes, among which would be many rarely, if ever, encountered by the general practitioner. Let us therefore mention only a few of the commoner causes, those which are almost daily seen in every osteopathic physician's office. We list them in the approximate order of their frequency.

1. *Anatomical Differences in Leg Length.*—Although x-rays of the pelvic and lumbar areas in the standing position have been made of only a small segment of the population, statistics gathered thus far would indicate that well over half of all human beings are asymmetrical laterally, due chiefly to variations in leg lengths. When one reflects upon the trauma to the epiphyses of the bones of the legs in childhood falls and bumps upon the knees, it is not surprising that the rates of growth of those long bones should vary.

2. *Fractures.*—Fractures of the bones of the legs, ankles, or feet are not uncommon and too frequently result in differences in total leg length.

3. *Arthritic Changes.*—Alterations of normal joint spaces in arthritis of knees, ankles, or feet by absorption of articular bone or cartilage will alter total leg lengths.

4. *Flat Foot.*—Collapse of the plantar arch of one or both feet will result in imbalance.

5. *Congenital Deformities of the Leg or Pelvis.*—Standing x-ray studies reveal a surprising number of cases of asymmetrical development of the two halves of the pelvis and even of the two halves of the sacrum. Differences in the development of the femoral heads are also seen. Both of these conditions produce imbalance of the pelvis.

6. *Osseous Infections and Metastases of Infections to the Acetabulum.*—The resulting destruction of bony material or the laying down of the resulting fibrosis alters the functional efficiency of the hip joint in addition to upsetting balance.

7. *Occupational Strains.*—Many kinds of work introduce postural abnormalities because of the positions of imbalance in which the body is kept for long periods. These imbalances involve to a great measure, the exaggeration of normal thoracic flexion, or the decrease of normal lumbar extension and may be produced in a sitting position. Office workers are prone to postural deviations along the anteroposterior axis of the body.

Now that we have reviewed some of the basic osteopathic principles and the significance of balance factors in osteopathic lesion production and maintenance, what is the relation of all this to systemic disease and of what value to osteopathic practice? Perhaps we can best demonstrate both of these phases by assuming a hypothetical case and laying out its therapeutic management according to these principles.

Let us say that the patient is a well-nourished male, 45 years of age, with no gross deformities and he complains of pains in the epigastric region a short time after eating, general nervousness, and the rest of the classical symptoms of duodenal ulcer. Let us assume also that the diagnosis has been confirmed by x-ray. In accordance with the osteopathic concept of disease, this ulcer pathology was produced by changes in the trophicity of the involved duodenal tissue by alterations in its normal nerve and blood supply caused by osteopathic lesions in the spinal area of the lesser splanchnic plexus, from about the fifth to the eighth thoracic segments. The usual osteopathic approach to such a problem is the administration of one of the common antiacids, more frequent feedings for palliation and osteopathic manipulative treatment of the thoracic lesions found. There is plenty of clinical evidence that this method is effective as are most therapeutic regimes that include osteopathic manipulative procedures. But let us analyze the basic causes in this common syndrome. From the osteopathic viewpoint, the lesion pathology in spinal structures is directly responsible for the vasomotor changes, the altered minute-volume of blood to the part, if you will, as well as for other changes in the trophicity of the involved mucosa. In that case, the factors producing and maintaining the osteopathic lesions are the real causes. Among those factors, since more than half of all humans are not in perfect balance, aberrations in posture are by all odds predominant. Our experience has included the management of numbers of this type of case, ranging from those with mild symptoms of the incipient syndrome to those of the emergency type suffering active hemorrhage into the lumen of the gastrointestinal tract. Never have we failed to find

deviations in postural balance, which, when considered in the treatment regime, aided materially in the recovery of the patient.

It should be pointed out that the term "deviations in postural balance" does not necessarily mean gross abnormality in balance, such as scoliosis, kyphosis, or lordosis plainly visible to the naked eye upon inspection. Many, if not most, of these patients appear to be blessed with that rare phenomenon of normal balance, and it is only by careful and diligent search and analysis that such imbalances are found. Furthermore, when found, these imbalances are often difficult of correction. Problems of this type should not be confused with the so-called "short-leg problem" or the frequently discussed "low-back problem." These conditions are only parts of the total problem of postural imbalance. Indeed it may be said that as many chief complaints referable to upper spinal osteopathic lesions will be found to have their origins in postural imbalances as lumbar conditions of various types.

As in the juxtapyloric ulcer syndrome used as an example, so also in a large catalog of human afflictions will postural imbalance prove to be an important factor. There is, of course, as yet no etiological classification of disease on a postural basis, but our experience has already revealed an amazing variety of pathological processes that clinically have responded to treatment on a postural basis. Conditions so apparently unrelated as to cause as neurogenic dermatitis, even of the pompholyx variety, and the classical syndrome of migraine have had their clinical courses markedly altered by careful analysis of postural aberrations and painstaking attention to the correction of these balance faults. In fact, in the instance of migraine, our prognosis has been entirely revised. No longer is it a matter of taking on such a case with the half-hearted hope that some relief may be afforded. With the postural approach, a permanent improvement can be made, frequently eliminating painful symptoms. Naturally, it is too early to do more than hazard a guess, but as osteopathic thinkers develop the postural approach to this affliction, it seems reasonable to conjecture that the osteopathic profession will offer real relief to the millions of migraine sufferers.

To the very few conditions that have been mentioned here, the case records of those osteopathic physicians who have realized the value of postural considerations would add many more, but it remains for the entire profession to become conscious of this potent therapeutic weapon before the full significance of postural imbalance to health and disease will be made a fact in the field of healing.

In the medical world as a whole, there are today, as there were more than 100 years ago, a few still small voices calling attention to the importance of posture. In the allopathic school of practice, the contemporary exponents are Steindler[11] and Goldthwait,[12] the latter the author of a book on the subject, which volume has had extensive sale. However, there is an extremely important variance in the significance of the findings in balance analysis between the allopathic and osteopathic concepts. The former emphasize the mechanical effects of gross postural deformities, such as ptosis of viscera, crowding of organs, and the like. In the main, the reflex effects of osteopathic lesions are unknown to allopathic writers and such effects are, of course, the outstanding reasons for the consideration of posture in disease. Granting even that some allopaths realize the existence of osteopathic lesions, they are not equipped, either by concept or training to do anything about them. In short, the postural approach to disease is practically an osteopathic "natural."

In our profession, the idea of the effect of body posture upon osteopathic lesion production and maintenance has grown slowly but steadily particularly since 1921, when the technic of the standing x-ray was introduced. Most osteopathic diagnosticians keep it in mind and since in their daily work they see scolioses, kyphoses, and other major imbalance evidence, such standing plates are quite common. One large x-ray film manufacturer has even published helpful suggestions for the x-ray technic.[13] To that extent, a beginning has been made.

Before World War II, German physicians were conducting research on the rate of growth of long bones in children. In Vienna a psychiatric clinic had begun a segregation of mental disorders on the basis of postural deformities. In current medical periodical literature there is constant reference to the part posture plays in disease processes. But all this is merely shadow-boxing, cropping at the fringes of the problem, so to speak. These sporadic attempts seemingly strike an impenetrable wall. The reason is obvious. The key to the entire relationship of posture to health lies in the entity of the osteopathic lesion, its production, maintenance, and correction. Therefore, in the development of this powerful therapeutic force, the osteopathic profession must light the way for the rest of the healing arts to the end that maximum benefit may be extended to suffering humanity.

SUMMARY

1. Postural imbalances do produce and maintain osteopathic lesions.

2. Compensatory mechanisms set into motion by such imbalances produce such lesions according to definite laws of physiological movement of spinal joints.

3. Adequate treatment of disease involves careful consideration of the possible part played by postural imbalance in the cause of disease.

Ottawa Arthritis Sanatorium and Diagnostic Clinic.

REFERENCES

1. Still, A. T.: Autobiography. Published by the author, Kirksville, Mo., 1897.

2. Fryette, H. H.: Physiologic movements of the spine. J. Am. Osteop. A. 18:1-2, Sept. 1918.

3. Schwab, W. A.: Principles of manipulative treatment—the low-back problem. J. Am. Osteop. A. 31:165, Jan.; 216, Feb.; 253, March; 292, April; 353, May; 384, June; 478, August, 1932; 32:89, Nov. 1932; 179, Jan.; 223, Feb.; 260, March, 1933.

4. Hoskins, E. R.: The development of posture and its importance. J. Am. Osteop. A. 33:529, Aug. 1934; 34:72, Oct.; 125, Nov.; 175, Dec. 1934.

5. Sutherland, W. G.: Personal communication.

6. Denslow, J. S., and Clough, G. H.: Electromyographic studies of structural abnormalities. J. Am. Osteop. A. 41:175-179, Dec. 1941.

7. Teale, T. P.: A treatise on neuralgic diseases dependent upon irritation of the spinal marrow and ganglia of the sympathetic nerve. E. L. Carey and A. Hart, Philadelphia, 1830.

8. Griffin, W., and Griffin, D.: Observations on functional affections of the spinal cord and ganglionic system of nerves, in which their identity with sympathetic, nervous and imitative diseases is illustrated. Burgess and Hill, London, 1834.

9. Riadore, J. E.: A treatise on irritation of the spinal nerves as the source of nervousness, indigestion, functional and organic derangements of the principal organs of the body, and on the modifying influence of temperament and habits of man over disease, and their importance as regards conducting successfully the treatment of the latter; and on the therapeutic use of water. J. Churchill, London, 1842.

10. Walton, W. J.: Manual of osteopathic technique. Epsilon Chapter, Sigma Sigma Phi Fraternity, Chicago College of Osteopathy, Chicago, 1945.

11. Steindler, A.: Mechanics of normal and pathological locomotion in man. C. C. Thomas, Springfield, Ill., 1935.

12. Goldthwait, J. E., *et al.*: Body mechanics in health and disease. Ed. 4. J. B. Lippincott Co., Philadelphia, 1945.

13. Cornwell, W. S.: The lumbosacral junction. Radiog. & Clin. Photog. (Eastman Kodak Co.) 19:30, 58, 1943; 20:2, 1944.

The Halogen Elements in Relation to Autonomic Dysfunctions and Degenerative Diseases, Including Cancer*

ALEXANDER LEVITT, B.S., D.O.
Brooklyn

INTRODUCTION

Accumulating reports of studies in medical and allied sciences provide considerable evidence that many diseases of degenerative nature, including cancer, are closely related phases of a large overall pattern of total body disintegration.[1,2] Functional and organic diseases are being considered as local tissue or organ manifestations of autonomic disorders which are influenced by environmental factors of many kinds.[3]

This report presents some phases of an extensive study in degenerative diseases, including cancer,[3] which deal with autonomic dysfunctions as systemic disturbances that favor inception and progression of tissue degenerative changes in general, and with halogen elements as external environmental factors that favor autonomic dysfunctions and degenerative diseases.

This report is presented in three parts:

I. Some Autonomic Dysfunctions Found in Many Degenerative Diseases, Including Cancer

II. The Halogens as Environmental Factors that Favor Autonomic Dysfunctions, Thereby Contributing to Degenerative Diseases

III. Summary

PART I—SOME AUTONOMIC DYSFUNCTIONS FOUND IN MANY DEGENERATIVE DISEASES, INCLUDING CANCER

AN IMPRESSION OF CLOSE RELATION

In preliminary accounts of this study,[1,4] it was reported that a concept of close linkage between many of man's degenerative conditions has developed out of experiences in over 4,000 cases of privately treated, chronic diseases with lesions of degenerative nature.

A PHENOMENON IN MANY DEGENERATIVE CONDITIONS

It was reported, also, that as part of and strengthening this overall concept of close linkage between degenerative tissue changes, an associated, repetitive phenomenon of functional imbalances of the vegetative or autonomic nervous system, together with certain endocrine disturbances and alterations in body metabolism, have been observed to occur with great regularity and frequency.

COMPONENTS OF THE PHENOMENON, GROUP SYNDROMES OF AUTONOMIC INSTABILITY, FOUND IN MANY DEGENERATIVE DISEASES

Vagotonia.—The autonomic nervous syndromes that have been most common to many degenerative conditions found in this study, have consisted of functional imbalances between the two divisions of the vegetative or autonomic nervous system, with vagotonia predominating in influence.

The influence of this vagotonic predominance appears to be one of "tissue conditioning or sensitivity" that is of allergic nature.[5] Vagotonic overactivities are associated with the accumulation of relative excess within the tissues of parasympathomimetic substances as acetylcholine, histamine, and other vagus-stimulating substances[6,7,8] which are favored by the influences of certain mineral electrolytes, hormones, and tissue enzymes.[9] Their interaction results in parasympathetic overactivities in tissues which include increased permeability of cell membranes, exudation of fluids, and increased alkalinity in the tissue.[6] It was observed that if these parasympathetic overactivity states occur sufficiently often or are prolonged beyond the cell's ability to recover, various states of a total cellular disintegration may occur.[10]

Parasympathetic- or vagotonic-caused physiochemical deficiency or sensitivity states are found in many degenerative conditions which range from poorly defined functional syndromes through terminal organic diseases, including cancer.[6,10,11,12,13,14]

Hypothyroidea.—Together with the syndrome of vagotonia, it has been found that many of the associated degenerative conditions have presented evidence of variable degrees of hypothyroidea or thyroid deficiency states. This finding of hypothyroidea appears to be of considerable importance, for normally the thyroid hormone acts with and reinforces the sympathetic division of the autonomic nervous system; it regulates the rate of body metabolism[15] including that of cholesterol;[16] it prepares or sensitizes body tissues to the effect of adrenalin;[17] and it regulates the rate of tissue differentiation.[18]

Thyroid functions, together with activities of the sympathetic nervous system, are concerned with defense of the body against infections.[11] Deficiency states of the thyrosympathetic system, in general, not only permit vagus overactivity, but they also permit infections and allergic syndromes to be superimposed upon sensitized tissues prepared by vagus stimulation.[10] The slowing of cellular metabolism and the accumulation of fluids in the tissues caused by thyroxin deficiencies[19] are quite similar to tissue changes present in vagotonic or allergic "tissue explosions."[6,20]

Thyroid deficiency states result in disorders in many autonomic functions and in many retrogressive tissue changes. This concept of causal relationship between hypothyroid states and autonomic or systemic disorders and degenerative tissue changes is strengthened by Rhoads,[21] who reports recent investigations in cancer as a systemic disease. Rhoads discusses a concept in which some primary biochemical change in cellular environments allows biological variants to develop and grow into malignant cells. He links the disturbed cellular environments that favor cellular variants and mutations with disturbances in protein, carbohydrate, and chloride metabolism, in addition to adrenal abnormalities. The writer believes that accumulating evidence strongly indicates that syndromes of vagotonia and hypothyroidea are major causative factors in the alteration of cellular environments that favor cellular mutations and tumor growths.

According to Wolf,[22] the thyroid hormone, thyroxin, which makes up about 65 per cent of the thyroid substances, is dependent upon iodine for its function. Wolf says that substitution of other halogens for body

*Presented before the Westchester County Osteopathic Society, White Plains, N. Y., May 19, 1948.

iodine, either completely or largely, destroys the effectiveness of thyroxin. Implications of this conclusion are discussed in Part II of this paper.

Hypercholesterolemia.—Associated with these syndromes of vagotonia and hypothyroidea, cholesterol—a normal constituent of the body—has been found commonly to be present in the blood in increased and sometimes in greatly excessive amounts.

Hypercholesterolemia is dependent, functionally, on hypothyroidea and disturbances in related autonomic functions. It appears to be of considerable interest and importance, for numerous investigators have associated abnormal blood levels of cholesterol with many degenerative diseases, including goiter, diseases of the heart, arteriosclerosis, arthritis, diabetes, and many other conditions, as well as cancer.[23,24,25,26,27]

How hypercholesterolemia and abnormal cholesterol metabolites may occur and cause degenerative tissue changes may be seen by reviewing some known facts about cholesterol metabolism.

The Steroid, Cholesterol.—Cholesterol, an alcohol of high molecular weight,[28] is one of the most important steroid substances in the human body.[29] It has a close chemical and biological relationship to lipids, fat-soluble vitamins, bile acids, sex hormones, aglycones, cardiac glucosides, hormones of the adrenal cortex, food poisons, and a number of known carcinogenic hydrocarbons.[27,30,31]

All the cells of the body contain cholesterol, the amount of which is relatively fixed for each tissue.[32] Cholesterol is present in the body in both the free state and combined with fatty acids, but is most abundant in the tissues of the nervous system.[28,33] About three-fourths of the blood cholesterol is found in combination with fatty acids and the remainder as free cholesterol.[28] The blood cholesterol is more or less evenly divided between the plasma and the erythrocytes.[34]

Cholesterol combines with the halogens[35] which include the chemical elements fluorine, chlorine, bromine, and iodine. This chemical affinity seems to be a most important factor in the oxidation-reduction phases of cholesterol metabolism; and it warrants careful consideration.

Insoluble in water, cholesterol confers on fat and oil associated with it the capacity to absorb relatively large quantities of water.[36] This capacity for water absorption which may assist in maintenance of proper cellular water balance may be brought about by an antagonistic relationship between cholesterol, phosphatids, and fatty acids. This water-absorbing capacity conferred by cholesterol is considered in this study to be of major importance in normal and abnormal cellular division. This premise seems to be strongly supported by the reports of Cantarow and Trumper,[37] Cantarow,[38] Stern and Willhelm,[39] and others. Harrow and Sherwin[32] suggest that, because of its insolubility, cholesterol tends to fall out of solution and deposit as plaques in the vascular system or as gallstones.

Mann[28] reports that the chief sources of body cholesterol are from food and body cellular disintegration, although cholesterol may be synthesized in the body.

Bloor[40] maintains that carnivorous and omnivorous animals get a considerable amount of cholesterol from the animal protein which they eat and the cholesterol problem with man is in getting rid of what is not needed, for cholesterol is difficult to burn and its excess must be excreted from the body. He discusses the possibility of cholesterol deposition in blood vessel walls from accumulated large amounts of blood cholesterol, and he cites the presence of actual deposits of cholesterol or cholesterol esters in sclerosed arteries.

Bloor[40] states that cholesterol has an important relationship to phospholipids with which it normally occurs in tissue cells and that this relationship is an important physiochemical balance. Cholesterol is antagonistic to the phospholipids[41,42] which hold in it colloidal suspension within the cell.[40,43] An example of this biophysiochemical balance is seen in erythrocytes where cholesterol prevents hemolysis, while lecithin promotes it.[42] With the removal or destruction of the vehicle, phospholipids or the fatty acids which suspend the cholesterol and which are unstable and easily oxidized,[44] the residue of cholesterol substances, which are less easily burned,[40] are precipitated into the tissues.[32]

Laroche and Grigaut[45] indicate that, at times and under the influence of various pathological factors, great quantities of cholesterol accumulate in the glands of internal secretions, particularly the adrenal cortex. This may explain why hypocholesterolemia or low cholesterol blood levels are sometimes found in hypothyroid states. This premise is supported by Laroche and Grigaut[45] who state that the thyroid gland exerts a regulating effect upon the cholesterol contents of the blood. Splenectomy, they report, is followed by a permanent hypercholesterolemia and lipemia of the blood serum.

Stone[16] points out that the liver, a major structure in the reticuloendothelial system, is the chief depot for cholesterol in the body.

Through analysis and integration of reports of many investigators, the writer has developed a working hypothesis concerning oxidation-reduction phases of cholesterol metabolism and formation of abnormal cholesterol metabolites, which he believes are capable of provoking sensitized or conditioned tissues into changes of degenerative nature.

It appears that cholesterol metabolism occurs as part of total cellular activities. Normally, the thyroid hormone, under the influence of the pituitary gland,[46,47] acts as a catalyst for oxygen bearing adrenalin[48] in cellular oxidation-reduction processes. Iodine of the thyroxin unites with cholesterol[35,36] as well as with the phosphorus of lipids[49,50] with which cholesterol is combined,[40] preparing them for oxidation. These activities provide for total interaction within cellular structures of endocrines, proteins, carbohydrates, vitamins, minerals, oxygen, and the tissue enzymes whereby cholesterol is reduced to 7-dehydrocholesterol,[51] the provitamin or parent substance of vitamin D,[52] the sex hormones,[45,52,53,54] and other substances[53,55,56] of which some metabolites may be abnormal.[57,58,59] At the same time, the thyroid substance raises the electrical potential of the body cell,[60] accelerates chemical cellular activities[47,61] in which the phospholipids are burned with the production of energy,[52] and increases the conductivity of the nerve fibers.[47] These cellular activities function in such normal manner when all the elements of autonomic processes are in physiochemical balance with each other or when homeostasis exists.

Support of the writer's explanation of cholesterol intracellular metabolism is seen in McDonald's[62] statement that "life is an oxidation-reduction rhythm dependent upon an oxidation-reduction potential that decides which one of the two systems will oxidize the other." This cellular oxidation-reduction activity appears to be an important phase of the vagotonic (parasympathetic) and sympathetic (thyro-adrenal)

antagonism as described by Pottenger.[11] McDonald[62] says that the potential decides the direction of the reversible reaction; but the rate is determined mainly by the oxidative catalysts whose influence must therefore be the most essential factor in the problem. McDonald[62] indicates that in cell oxidation-reduction processes there are living catalysts which are known as "dehydrogenases" or "dehydrases." These living oxidative catalysts may be the thyro-parathyro-adenoxidase of Sajous.[48]

The works of McDonald,[62] Cook,[57] Fieser,[63] Stern and Willhelm,[64] Thannhauser,[65,66] Roffo,[67,68,69] and others strongly indicate that cholesterol, which is photosensitive and capable of providing energy when completely oxidized, can act as an irritant, disturb water balance in the cell structure, and generally upset balanced autonomic functions when incompletely metabolized. It seems probable that through effects of certain influences, cholesterol metabolites may set up abnormal mitotic changes and force cell division in tissues with conditioned deficiencies. These changes seem probable when cholesterol is incompletely oxidized or is activated into an irritant factor by irradiation or actinic rays, in the absence of adequate, essential tissue-protective elements.

Deficiencies of endocrines, proteins, carbohydrates, vitamins, electrolytes—especially calcium, iron and others, iodine, and tissue enzymes, which result in tissue deficiency states or favor incomplete or abnormal oxidation-reduction phases of cholesterol metabolism, may be responsible for the formation of abnormal cholesterol metabolites that are capable of producing degenerative tissue changes. These abnormal cholesterol metabolites may favor also the occurrence of autonomic imbalances and tissue deficiency states.

As described above, several activities concerning cholesterol probably result from cellular oxidation-reduction processes. Due to incomplete oxidation, cholestrol substances or derivatives may fall out of solution from their colloidal mixture or suspension[32,42] in phospholipids in which lecithin predominates.

Unbound cholesterol substances may be deposited in the very tissues in which they are located;[32,70,71] or they may be picked up by the blood for deposit elsewhere[71] for resynthesis or excretion.[28,40,72,73] While cholesterol substances may be recombined with the phospholipids or fatty acids of the body,[74] they may, as free or combined cholesterol, act as irritants in the tissues in which they accumulate.[75,76,77,78]

As irritants, abnormal cholesterol metabolites, in addition to possible direct influence upon tissues in which they are developed, may be picked up by phagocytic monocytic elements of the reticuloendothelial system which, according to Cowdry,[79] Thannhauser,[80] and others, now become foam cells. Leary,[78] Thannhauser,[81] and others report that these foam cells are deposited or invade vulnerable tissues in the body; and, depending on the effectiveness of defense systems and amounts of xanthoma cells present, degenerative disease states of variable degree or severity develop in the invaded tissues.

In cases viewed at first hand in this study and in reports of other investigators, it has been found that tissue degenerative changes with hypercholesterolemia vary from the relative lesser lesions as cutaneous xanthoma[74] through more severe degenerative lesions as myxedema,[82] diabetes mellitus,[74,83] arteriosclerosis,[75,84,85] diseases of the biliary tract and liver,[86] the nephrotic syndromes,[87] bone diseases,[88] cancer,[89] and other conditions. The premise for the inclusion of cancer among degenerative conditions, caused by abnormal cholesterol metabolites, is supported by the finding of high cholesterol deposits in tumors as reported by Roffo,[68] Stern and Willhelm,[90] and others, and because cholesterol derivatives have been reported to produce and stimulate experimental tumors.[63,91,92,93,94]

As an irritant, cholesterol may produce an increase in water content or cellular dropsy.[37,43,95] Stern and Willhelm,[95] in discussing water metabolism in tumor formations, state that the central parts that were richer in cholesterol showed a higher water content than did the cholesterol-poorer outer portions. Also, cholesterol interacts synergistically with hydration-promoting ions of potassium, sodium, and chlorides which favor vagotonic states thereby causing increased cellular water content.

While cholesterol action is contrary to that of calcium,[96] the metabolism of one has an important bearing on that of the other. Disturbance of water balance and mechanical irritation caused by the relatively insoluble cholesterol substances may result in abnormal cellular activity.[97,98,99] In some instances, cells so irritated either by cholesterol derivatives or foam cells die and are replaced by reparative fibrous tissue cells which, in time, may be impregnated with calcium salts.[66,75,100]

Associated with formation of abnormal cholesterol metabolites during the process of incomplete oxidation-reduction of cholesterol, the phospholipids, the fatty acid factor of the cholesterol ester, because of comparatively easier oxidation,[44] yields a comparative excess of acetone bodies[101] and acetylcholine,[102] the parasympathetic mediator or hormone. Acetylcholine is associated in function with the vagus stimulant, the amine, histamine, derived from the amino-acid, histidine.[103,104] Acetylcholine or histamine may be responsible for the allergic phases of vagotonia. Histamine, probably a normal product of cellular activity, involving amino-acid metabolism and an end product of intestinal bacteria acting upon intestinal proteins,[105] possesses toxic properties and the ability to produce exudative phenomena and allergy syndromes,[103,106] including migraine.[107]

In review, it may be stated briefly that since body defense mechanisms are impaired in vagotonic or hypothyroid states, resulting in tissue and systemic disturbances, abnormal cellular metabolites, including those of cholesterol, may occur and accumulate in previously sensitized or conditioned cellular structures and thereby provoke degenerative tissue changes there.

PART II—THE HALOGENS AS ENVIRONMENTAL FACTORS THAT FAVOR AUTONOMIC DYSFUNCTIONS, THEREBY CONTRIBUTING TO DEGENERATIVE DISEASES

Vagotonia, hypothyroidea, and disturbed cholesterol metabolism are syndromes of autonomic imbalances, systemic deficiencies, or constitutional inadequacies that cause primary tissue deficiency states and degenerative diseases, including cancer. Hence, environmental factors that favor these phases of disturbed autonomic functions play important roles in primary tissue deficiencies and organic diseases.

The possibility that wide use of the halogen elements in various phases of our modern life—agriculture, industry, medicine, and sanitation—plays some important role in present upsurging mortality rates due to degenerative diseases, including cancer,[108,109] has received much consideration in this study. It has been found that the halogen elements exert positive influences, from a viewpoint of geographic or regional distribution, upon thyroid functions, other homeostatic activities, and degenerative diseases. Some factors which have led to this conclusion are as follows:

The four halogens—fluorine, chlorine, bromine, and iodine, which represent a typical family of chemical elements—are present in the earth's crust, oceans, and atmosphere, but only in combined forms.[110,111]

Free halogens possess the following common properties:

1. They are poisonous and corrosive.[111]
2. They are nonmetallic, forming anions, alone or in combination with oxygen.[113]
3. They are important oxidizing agents; and, when they act, they are reduced to a halide salt.[112]
4. "Any halogen will set free a halogen of higher atomic weight than itself from any halide salts of the latter."[113]
5. Halogen displacement will take place in the following order:[114]
   a. Fluorine will displace chlorine, bromine, and iodine.
   b. Chlorine will displace bromine and iodine.
   c. Bromine will displace iodine from iodine compounds.
6. Because of their germicidal effectiveness, which is related to their oxidizing properties, the halogens—especially fluorine and chlorine—are used to render drinking water bacteriologically safe for animal and human use.[115,116]
7. The halogen compounds are found in the following manner in animal and human bodies:[117]
   a. Fluorine compounds are present in small amounts in bones and enamel of teeth.
   b. Chlorine, in sodium chloride, is present in larger amounts in the blood and other body fluids including the gastric juice.
   c. Iodine is present in the compound thyroxin.

Fluorine.—Hopkins and others[114] report that fluorine is the most active nonmetal and the most vigorous oxidizing agent known. When combining with water, it takes up hydrogen and releases oxygen. Fluorine is used considerably as a refrigerant; in etching glassware; in making steel, enameled ware, and aluminum; and in insect powders and fruit sprays.[118]

Sherman[119] reports that fluorine is unevenly distributed in nature, and natural waters of some regions may contain enough fluorine to have deleterious effects upon animals living in those regions. He cites studies which show that mottled tooth enamel is due to fluorides present in drinking water.

According to Hodges and others[120] long industrial exposure to cryolite or to crushed phosphate rock containing sodium fluoride eventually causes sclerosis of the bones, the tendinous attachments of muscles, and other body tissues. These investigators state that "cases of radiologically demonstrable skeletal sclerosis in which fluoride-contaminated drinking water appeared to be the only causative factor" have been reported from North Africa, India, and Argentina. They report, also, that permanent teeth will be mottled if children habitually drink water containing 1 part per million (p.p.m.) of fluorine salts as sodium flouride during the period of enamel development.

The fluoride content of public water supplies in some American communities is greater than 3 p.p.m., according to Hodges and his co-authors.[120] These investigators indicate that contamination of food due to fluoride fruit and vegetable sprays, fertilizers, and stock foods which contain fluorides as impurities cause increasing dangers of skeletal sclerosis.

Conflicting reports regarding values and hazards of fluoride treatment of drinking water are found in the accumulating literature which deals with water purification and dental caries. For purposes of this report, a few samples of diverse opinions are cited.

It is the consensus of many investigators who have studied the fluorine content of drinking water in relation to optimum nutrition that the ideal flourine levels range from 0.3 to 0.5. p.p.m. of water. They believe that fluorine, when maintained at about these levels, exercises a necessary and beneficial action. Where waters contain less than 0.1 p.p.m., the incidence of caries is high. In contrast, where fluorine levels in food and drink are too high, mottling of the teeth occurs.[121]

Burwell and others,[122] discussing the use of virgin bone black for removal of fluorides from drinking water, report that "the presence of fluorides in excess of 1 p.p.m. makes the water unsafe and is ground for rejection of the water supply."

Dean[123] has found that dental caries are reduced through drinking water containing concentrations of fluorine at 1 p.p.m. which also causes mottled enamel.

Mechanisms by which fluorides may restrain dental caries are being studied by investigators. For example, New York State is conducting a 10-year Newburgh-Kingston fluoride experiment with the hope that fortification of drinking water with fluorine will reduce dental decay in persons drinking that water.[124] The fluorine, because of its strong oxidizing properties,[112] serves also in rendering the water bacteriologically safe.

Cox[116] reports that, in the Newburgh-Kingston fluoride experiment, the fluorine content of the Newburgh supply is increased from an average of 0.1 parts per million to about 1.2 p.p.m. by adding 2.56 p.p.m. of 95 per cent sodium fluoride. The fluoride level of 1.2 p.p.m. seems in excess of the upper range of safe fluoride levels as reported by Dean[123] and Burwell and others.[122]

Figures which represent the germicidal doses, in parts per million, of fluorine for rendering water bacteriologically safe have not been found by the writer. Therefore, since fluorine is the most vigorous of the halogen elements in oxidizing properties, it is assumed that germicidal doses of fluorine need not exceed the doses recommended for chlorine,[125] which are approximately 0.05 to 0.5 p.p.m. Hence, it appears that the Newburgh drinking water which has been fortified with sodium fluoride to 1.2 p.p.m. contains flourine in amounts that are toxic[122] and in excess of germicidal doses.

Dean,[123] reporting wide distribution of endemic fluorosis in this country, states that sufficient evidence has been found to suggest that with high fluoride concentrations in drinking water there is an apparent tendency to high evidence of gingivitis.

Use of fluorine above the concentration of 1 p.p.m. increases the hazards of dental fluorosis[126] and

probably exposes the water drinker to fluorine-caused goiter.[121,126]

Wilson[126] reports that distribution of endemic goiter in the Punjab, India, and in England has been found to be directly related to the geographic distribution of fluorine and human dental fluorosis. Rocks containing fluorine are found geologically outcropping in parts of Cornwall, Derbyshire, Cumberland, and Durham—regions which are among the most goitrous areas in England. Wilson[126] reports also that the use of fish in a coastal area of Essex with a high degree of dental fluorosis has helped to counteract the effects of a local, regional iodine deficiency.

In Germany, it has been found that fluorine content of drinking water in goitrous regions is higher than in nongoitrous districts.[121]

Sherman[119] says that because of the chemical relationships of iodine and fluorine, there is a striking contrast in the nutritional significance of their occurrence in drinking water.

In view of these findings and the ability of fluorine to displace iodine, it would seem important to survey the geographic region supplied with Newburgh drinking water to determine possible increases there in physical defectiveness, thyroid deficiency states, or degenerative diseases since starting the fluoride experiment sponsored by the New York State Health Department.

Chlorine.—Investigators[127,128] report that chlorine is the most abundant of the halogen elements

Like fluorine, chlorine is a powerful oxidizing agent.[129] When combined with water, in which it is moderately soluble, it takes up hydrogen and releases oxygen.[130]

Chlorine is used in common salt, as a bleaching agent, as a germicide, for sterilization of public water supplies, and in lethal gases.[131] It is used also in the manufacturing of chlorinated hydrocarbons which include methylchloride (a local anesthetic), chloroform (a general anesthetic and solvent for oils, fats, iodine, and rubber), and carbon tetrachloride (a noninflammable solvent for oils, resins, and rubber, a cleansing agent, and fire extinguisher).[132]

Drinker and others[133] report an investigation concerning possible systemic effects from ingestion or inhalation of certain chlorinated hydrocarbons, following three fatal cases of jaundice in workmen using these products. They found that compounds more highly chlorinated than trichlornaphthalene are capable of causing liver damage when inhaled steadily in quite low concentrations. They add that investigations indicate that it is quite probable that workmen never inhale enough chlorinated hydrocarbons to get acute yellow atrophy of the liver, but workmen may, through inhalation, "acquire a substratum of liver damage" upon which other liver conditions may develop. Such liver damage would impair the individual's ability to metabolize cholesterol properly[16] and perform other essential liver functions.

Chlorine is widely used in treatment of public water supplies for rendering drinking water biologically safe. However, there seems to be uncertainty and dissatisfaction in water purification by chlorination. Pollution of large sources of water varies from time to time and requires different amounts of chlorine for making the water "safe" to use.[134] The amount of chlorine necessary to kill organisms varies with different sources of water and depends, also, on the water temperature and quantity of absorptive organic matter present in the water.[135] It is reported[134] that it is not possible to make large water supplies safe by chlorine alone because "no one could drink really safe chlorinated water" without deleterious effects upon his health.

Reported germicidal doses of chlorine for rendering drinking water biologically safe range from approximately 0.05 to 0.5 parts per million of water by weight.[135]

The Committee on Water Supply of the American Public Health Association, according to Horwood,[135] recommends that residual chlorine in water should be 0.5 p.p.m.

Regarding chlorine levels in drinking water, Wallace and Tiernan Company,[136] makers of chlorine control apparatus for chlorination of water, advise:

> The amount of chlorine required is dependent entirely upon the composition and quality of the water to be treated. We have found from general practice that a filtered water requires from 0.12 to 0.40 p.p.m.; spring or well water from 0.20 to 0.50 p.p.m.; and raw surface water from 0.30 to 1.00 p.p.m. (p.p.m. = parts per million. One part per million—p.p.m.—is equivalent to 8.3 pounds for each million gallons.) There are occasionally exceptional waters that require more chlorine than indicated by the foregoing, but they are unusual. It appears that surface waters in cold climates, such as Canada, in winter, require more chlorine than surface waters in warm climates.

Horwood[137] says that some doubt has arisen about the theory that water bacteria are destroyed by nascent oxygen alone. He states that the direct toxic action of chlorine and its compounds may account for the germicidal effects of water treatment by chlorination.

Goldfish and flowers have been reported killed by water with high chlorination.[138] Deming[138] reports that certain streams on the slopes of the Andes carry away many tons of dissolved hydrogen chloride, and these waters are so acid that no fish can live in them.

According to available reports, New York City, the largest coastal city in the United States, with a higher incidence of cancer than the rest of New York State,[139] used for most of its population chlorine-treated water with no reported iodine content for the year 1944.[140] The rest of New York State, with a lesser incidence of cancer, used less chlorine-treated water for human needs.[141] Thus, the advice of the New York State Department of Health[142] that surface water should always be chlorinated, in the face of the increasing mortality rates due to degenerative diseases, including cancer, seems in sharp conflict with warnings of Marine,[143] Kimball,[144] McClendon,[145] Wolf,[22] and others. Their integrated reports advise that iodine in water and soil is essential to adequate thyroid function and total body health; that halogen substitution and interchange may result in loss of essential iodine from the body; and that many degenerative diseases, including cancer, may result from iodine deficiency states functioning through subnormal thyroid conditions and impairment of cellular activities.

During 1940, New York City residents received chlorine-treated drinking water from two main sources:[141] a city-owned system, which supplied the larger part of the city, and the New York Water Service Corporation, a private water company, which supplied a comparatively small part of the city. The latter source probably provided some nonchlorinated water to some small part of the city's population.

Reports[140] of water analyses of samples obtained from three different New York City-owned water sources, for the year 1944, are cited. Similar reports were not obtained from the privately owned water

service corporation; hence they are not shown. Cancer mortality rates for New York City and upstate regions for the year 1942[139] also are shown. While the years cited do not coincide for the groups compared, the records indicate trends toward higher cancer rates where chlorinated drinking water is used.

AVERAGE ANALYSIS FOR THE YEAR 1944 OF THREE NEW YORK CITY-OWNED WATER SOURCES WHICH PROVIDED MOST OF THE CITY WITH DRINKING WATER[140]

Source of Sample	Amount of Chlorine (p.p.m.)
Croton Supply	3.8
Catskill Supply	2.1
Long Island Supply	8.6

For New York City which is supplied with chlorinated drinking water, the cancer mortality rate for the year 1942 was 166.1 per 100,000. In upstate New York which is supplied with chlorinated and nonchlorinated drinking water, the cancer mortality rate for the year 1942 was 152.8 per 100,000.[139]

From this study, one may conclude that the chlorine content of New York City's drinking water exceeds germicidal doses and is toxic. Thus, one may conclude that high chlorination of water favors halogen interchange with iodine loss, thyroid deficiency states, and degenerative diseases, including cancer, in people who use it.

Authorities recommend water filtration along with chlorination,[134] thus indicating that chlorination, alone, has been unsatisfactory. Thus, hazards and uncertainties of water chlorination would seem to indicate that there is need for water treatment methods that will not expose the water user to excess free chlorine and that will protect him from iodine deficiency or loss and thyroid deficiency states. This conclusion is supported by reports of other investigators.

A bulletin of the United States Public Health Service[146] reports that "The incidence of simple goiter appears to have increased in this country since water supplies have been more effectively safe-guarded." The bulletin cites the study of Marine and Kimball concerning goitrous conditions in Portland, Oregon, and Seattle and Tacoma, Washington. These investigators found that "there has been a rapid increase in goiter since these cities began to take their water (now chemically and bacteriologically pure) from the Cascade Mountains." The bulletin adds:

> Similar increases have been noted in many other communities following the substitution of filtered, chlorinated, and safe water supplies for those that were manifestly polluted and unsafe. It is particularly interesting to note that in the Southern States, where the incidence of endemic goiter is relatively less frequent than in the Great Lakes Basin and Pacific Northwest, considerable quantities of the drinking water are manifestly polluted. Conversely the malady is unduly prevalent in many communities in other sections of the country having safe water supplies.

The same bulletin[146] states that "it has been estimated that a decided increase in the amount of goiter has followed the greater consumption of chlorinated water." This concept includes the supposition that a nonassimilable iodine compound is formed as the result of action "between iodine naturally present in the water and chlorine added for disinfecting purposes." The bulletin states that "no convincing evidence" of such chemical reaction has been produced. However, the bulletin itself does contain information that supports the concept of causal relationship between chlorinated water and goiter. That information is as follows:

> During several State-wide thyroid surveys made by the Public Health Service it was possible to gather information concerning the chemical disinfection of water supplies in three widely separated States—Oregon, Tennessee, and Connecticut. . . . the goiter incidence is slightly higher among the users of chlorinated water in Tennessee and Connecticut than among those using unchlorinated water. In Oregon, however, the situation is reversed, the slightly higher goiter incidences occurring among children living in communities in which unchlorinated water is provided.

Oregon, according to McClendon,[147] had the second highest goiter rate among men drafted for service in the United States Army during World War I. Goiter is linked with iodine deficiency states which chlorinated water favors.

The same U. S. Public Health Bulletin[148] states that "chlorination is widely practiced in the Southern States, where goiter is relatively infrequent." McClendon,[149] who links goiter with iodine deficiency, indicates that southern areas of the United States have considerably less iodine deficiency than do the northern regions of the nation.

Hibbard[150] reports an experimental study on thyroid hyperplasia produced in a relatively nonendemic geographic region on an increased intake of chloride combined with a diet deficient in iodine. The study according to Hibbard, followed Hallwig's premise that a positive factor and not a deficiency of iodine is the essential cause of goiter; that an increased intake of calcium chloride represents a positive agent and if combined with a deficiency in iodine hyperplasia of the thyroid gland will result. Hibbard found that definite changes occurred in the thyroid gland when a diet high in calcium chloride and low in iodine was used. He found that similar thyroid changes occurred when laboratory test animals were fed on a diet high in sodium chloride (common table salt) and low in iodine. He concludes that chlorine (or the halogens as a group) may act as a positive factor in the production of thyroid hyperplasia.

Support to Hibbard's conclusion is given by Remington,[151] Sharpless and Anthony,[152] and others who have found that feeding an excess of chlorides decreases concentration and utilization of iodine in the thyroid in both normal and iodine-deficient glands.

Linking chlorine with cancer, which conveys an implication of disturbed chloride metabolism that may include an excess chloride intake or long exposure to chlorinated water in the presence of a relative deficiency of iodine, Behan[153] cites a report of Harpruder. The latter found chlorines to be increased in the serum of a patient with cancer.

Bromine.—The halogen element, bromine, is capable of chemical reactions that are characteristic of the whole halogen family.[129] Less active than fluorine and chlorine, it is more active than iodine.[114]

Elementary bromine is used in the manufacture of dyes, chemicals, tear gases, photographic films and plates, medicines, ethyl gasoline, and other organic compounds.[154]

The effectiveness of bromine for treatment of drinking water has been established along with chlorine and iodine by Beckwith and Moser.[116] These investigators found that all three halogens were quite effective at levels of 0.1 p.p.m. of each. However, of these three,

bromine gave a higher percentage efficiency at 0.25 p.p.m. than did the other two halogens under the same conditions.

Since bromine has reactions similar to fluorine and chlorine, one may conclude that long exposure to bromine or its compounds, in the absence of adequate iodine with which to meet the challenge of halogen displacement, would result in disturbed thyroid functions in the individual so exposed.

Iodine.—This element is the fourth and least active of the halogens. Although present in the body only in traces, it is essential to life.[155]

Iodine is used in the manufacture of drugs, dyes, antiseptics and photographic materials.[156] It is also used in making drinking water bacteriologically safe, and for the prevention of goiter.[157,158,159,160]

Scientists of the United States Army Medical Department, Quartermaster Corps and Corps of Engineers report a new iodine tablet for purifying water in the soldier's canteen, instead of the chlorine type tablets used during the War.[161] They state that the tablets dissolve more quickly than do the chlorine tablets and liberate 7½ parts per million of the elemental iodine. They report that this method of water purification was subjected to extensive testing and was found to be safe and highly effective.

Sherman[162] reports that air-borne sea-salt dust is the source of iodine in rain water, soil water, soils, and crops of nearby regions. He says that iodine-bearing rocks also may yield significant amounts of soluble iodide in their natural weathering. Thus, he points out, geographic areas whose waters do not pass sufficiently close to such rocks, and which, because of high mountain barriers or too great distance, receive little if any of the air-borne salt dust may lack enough iodine to meet the basic needs of normal nutrition. Such an iodine deficiency can be overcome, says Sherman, by adding iodide to drinking water or table salt, by using seafoods or sea plants which are rich in iodine, and by incorporating iodine compounds into tablets to be taken with food.

Sherman[162] points out that infection associated with contaminated water supplies or other unhygienic conditions may also contribute to goiter formation. In connection with this he cites studies of McCarrison who found that the more nearly perfect the nutritional intake, the more nearly perfect the thyroid gland will be in both structure and function.

Sherman[162] cites the study of McClendon and Williams (1923) who correlated the iodine content of drinking water with the prevalence of goiter in four zones in the United States. They found:

PARTS OF IODINE PER BILLION OF WATER	GOITER RATE PER 1,000 POPULATION
0.01 - 0.1	15-30 cases
0.015- 1.2	5-13 "
0.06 - 9.0	1-5 "
1.4 -10.0	less than 1 case

The study by McClendon, Barrett and Canniff (1934) who compared iodine contents of Minnesota potatoes to goiter rates in that State is also cited by Sherman.[162] They found:

PART OF MINNESOTA	AVERAGE IODINE CONTENTS OF POTATOES	GOITER RATE PER 1000
Eastern	85	19
Western	226	7.5

MacLeod[163] says that an inadequate intake of iodine results in thyroid disease. He points out that such disease is apt to occur in regions where the water is hard. These areas, according to MacLeod, include the cities bordering on the Great Lakes and rivers of the United States, certain districts in the Rocky Mountains and Switzerland, and the chalk regions of England.

Kimball[164] associates the incidence of goiter with a deficiency in the iodine content of water, indicating that regions which have no iodine have the highest incidence of goiter.

A comparative study of endemic goiter and iodine content of water, milk, and pasture was made in certain rural areas of the English counties of Somerset and Suffolk.[164] The investigators found that the average iodine content in Somerset was 2.9 micrograms per liter of water and the percentage of girls with large thyroids averaged 35.7 per cent. In contrast, Suffolk County presented 8.2 micrograms of iodine per liter of water and the percentage of girls with enlarged thyroid glands averaged 3.7 per cent.

These findings indicate that iodine-poor water or water-borne halogens which cause iodine loss from the body result in thyroid deficiency states.

Sherman[165] finds that the same lack of iodine which causes goiter may also be responsible for myxedema. He cites the findings of Marine that the principal function of the thyroid is to increase oxidation processes in the body, thus there is an interaction between bodily activities and the state of thyroid function.

MacLeod[166] associates thyroid functions with constitutional states. Bauer[167] links constitutional inadequacies with thyroid dysfunctions, nervousness, various functional physical and mental disorders, allergies, and many degenerative diseases, including angina pectoris and cancer. There is a deficiency of iodine in the low lands of Europe and England, which are areas with a high incidence of goiter and cancer.[145,168,169,170]

McClendon[145] reports the studies of Stocks and Karn who concluded that there is a positive etiological correlation between the occurrence of goiter in children and cancer mortality in the large towns of England and Wales, as Stocks previously concluded for the general population of Switzerland and America. Stocks and Karn, according to McClendon, also found a positive relationship between goiter and deaths from Graves' disease in England and Wales. McClendon says that evidence is reasonably conclusive that: (1) Thyroid adenoma may predispose to cancer of the thyroid; (2) the goiter factor may be a reason for the increasing cancer rates; (3) goiter prophylaxis with iodine in the young and desiccated thyroid in the aged may be effective in restraining cancer.

Geiger, discussing Weston's report,[171] says that goiter may be a factor in the occurrence of cancer. He says that "in the Berne, Switzerland, area, an endemic center of goiter, the occurrence of malignant growths is about 1 to 100, while in the United States it is 1 to 1,000."

The regions in Europe and America described by Braithwaite,[168] Stevens,[169] Albrecht,[172] Bigelow and Lombard,[173] and other workers quoted in this study, as having the highest incidence of degenerative diseases, including cancer, represent similar kinds of places with much soil demineralization and deficiencies. Iodine deficiency appears to be a major environmental inadequacy in such regions.

PART III—SUMMARY

1. Accumulating evidence strongly indicates that displacement and substitution of other halogens for iodine may occur in regions where fluorine, chlorine, or bromine are used in relatively excessive amounts.

2. Such halogen displacement causes iodine deficiency states which favor autonomic dysfunctions, including hypothyroidea, vagotonia, and hypercholesterolemia—three elements of a phenomenon commonly found in many degenerative diseases, including cancer.

3. The natures and mechanisms of these autonomic dysfunctions—vagotonia, hypothyroidea, and hypercholesterolemia, which are related to natural and man-made iodine deficiency states—favor inception and progression of degenerative tissue changes of which they are integral parts. Hence, without these autonomic disorders cancer and many other degenerative diseases probably would not occur.

4. Fluorine, chlorine, and bromine, as environmental factors, through halogen interchange and iodine displacement, may be responsible for geographic or regional occurrences of iodine deficiency states, autonomic dysfunctions including hypothyroidea, vagotonic syndromes, and other systemic disorders, and many degenerative diseases, including cancer.

5. The effective restraint of autonomic dysfunctions and degenerative diseases, including cancer, which iodine-displacing halogens seem to favor, requires that the uses of the halogen elements—fluorine, chlorine, and bromine—in agriculture, industry, medicine, and sanitation should be effectively safeguarded.

45 Tennis Court

REFERENCES

1. Levitt, A.: A study in degenerative diseases, including cancer. J. Am. Osteop. A. 47:135-143, Nov. 1947.
2. Ivy, A. C.: Drug therapy in degenerative disease. J. Am. M. A. 136:909-911, April 3, 1948.
3. Levitt, A.: A study in degenerative diseases, including cancer; a project in preventive medicine. Published by the author, Brooklyn, 1947-1948.
4. Levitt, A.: A study in degenerative diseases, including cancer. Presented at the Forty-Ninth Annual Convention of the New York State Osteopathic Society, New York City, Oct. 5, 1947.
5. Pottenger, F. M.: Vegetative or autonomic imbalance in disease, in Cyclopedia of medicine, surgery and specialties. F. A. Davis Co., Philadelphia, 1940, Vol. XIV, p. 634.
6. Wittich, F. W.: The present day concept of allergy phenomena. Medical Briefs, 2:2-3, Sept. 1946.
7. Feinberg, S. M.; Durham, O. C., and Dragstedt, C. A.: Allergy in practice. Ed. 2. Year Book Publishers, Chicago, 1946, p. 800.
8. Behan, R. J.: Cancer. C. V. Mosby Co., St. Louis, 1938, p. 92.
9. *Op. cit.*, ref. 5, p. 626.
10. Hansel, F. K.: Allergy of the nose and paranasal sinuses. C. V. Mosby Co., St. Louis, 1936, p. 114.
11. Pottenger, F. M.: Symptoms of visceral disease. Ed. 4. C. V. Mosby Co., St. Louis, 1930, pp. 207-217.
12. *Op. cit.*, ref. 8, pp. 87-93.
13. O'Neill, J. J.: Minerals lacking in precancer state. New York Herald Tribune, April 14, 1946, Sec. II, p. 14.
14. Klemperer, P.: Pathologic-anatomic aspects of allergy, in Allergy in theory and practice, by R. A. Cooke. W. B. Saunders Co., Philadelphia, 1947, pp. 69-80.
15. *Op. cit.*, ref. 11, p. 401.
16. Stone, C. T.: Clinical importance of cholesterol. South. M. J. 28:705-710, Aug. 1935.
17. Sajous, C. E. de M.: Internal secretions and principles of medicine. Ed. 10, revised. F. A. Davis Co., Philadelphia, 1923, Vol. I, pp. 143-168.
18. Wolf, W.: Endocrinology in modern practice. Ed. 2. W. B. Saunders Co., Philadelphia, 1939, pp. 242-243.
19. *Op. cit.*, ref. 18, p. 245.
20. *Op. cit.*, ref. 10, p. 266.
21. Rhoads, C. P.: Cancer as a systemic disease. Am. Rev. Soviet Med. 4:333-342, April 1947.
22. *Op. cit.*, ref. 18, p. 252.
23. Cantarow, A., and Trumper, M.: Clinical biochemistry. Ed. 3, revised. W. B. Saunders Co., Philadelphia, 1945, pp. 149-157.
24. Muller, G. L.: Clinical significance of cholesterol. Am. J. Digest. Dis. 12:355-377, Nov. 1945.
25. Leary, T.: Atherosclerosis, the important form of arteriosclerosis, a metabolic disease. J. Am. M. A. 105:475-481, Aug. 17, 1935.
26. Stern, K., and Willhelm, R.: Biochemistry of malignant tumors. Reference Press, Brooklyn, 1943, pp. 144-156.
27. Thannhauser, S. J.: Lipidoses; diseases of the cellular lipid metabolism, in Oxford medicine, edited by H. A. Christian. Oxford University Press, New York, 1940, Vol. IV (214), pp. 13-16.
28. Mann, F. C.: Physiology of the liver and biliary tract, in Cyclopedia of medicine, surgery, and specialties. F. A. Davis Co., Philadelphia, 1940. Vol. IX, p. 16.
29. Harrow, B.: Text book of biochemistry. Ed. 4. W. B. Saunders Co., Philadelphia, 1946, p. 40.
30. Stokes, E. H.: A clinical and experimental investigation of the blood cholesterol content in myxedema and other conditions. Sydney Australasian Medical Publishing Co., Ltd., Sydney, 1941, p. 6.
31. *Op. cit.*, ref. 23, p. 139.
32. Harrow, B., and Sherwin, C. P.: Textbook of biochemistry. W. B. Saunders, Philadelphia, 1935, p. 734.
33. *Op. cit.*, ref. 32, p. 733.
34. Kleiner, I. S.: Human biochemistry. C. V. Mosby Co., St. Louis, 1945, p. 471.
35. *Op. cit.*, ref. 34, p. 78.
36. Knudson, A.: Fats (lipids), chemistry of, in Cyclopedia of medicine, surgery, and specialties. F. A. Davis Co., Philadelphia, 1940. p. 263.
37. *Op. cit.*, ref. 23, p. 140.
38. Cantarow, A.: Progress in medicine; cholesterol metabolism. Internat. Clin. 1:237-279, March 1935.
39. *Op. cit.*, ref. 26, p. 76.
40. Bloor, W. R.: Blood lipids including cholesterol, in Cyclopedia of medicine, surgery and specialties. F. A. Davis Co., Philadelphia, 1940, Vol. II, p. 487.
41. *Op. cit.*, ref. 32, p. 735.
42. *Op. cit.*, ref. 40, p. 488.
43. *Op. cit.*, ref. 34, p. 262.
44. *Op. cit.*, ref. 36, p. 258.
45. LaRoche, G., and Grigaut, A.: La cholestérolémie. Métabolisme —clinique—thérapeutique. J. méd. franç. 24:49-55, Feb. 1935.
46. *Op. cit.*, ref. 17, pp. 160, 173.
47. *Op. cit.*, ref. 18, p. 244.
48. *Op. cit.*, ref. 17, p. 160.
49. *Op. cit.*, ref. 17, pp. 160-161.
50. Chidester, F. E.: Nutrition and glands in relation to cancer. Lee Foundation for Nutritional Research, Milwaukee, 1944, p. 63.
51. *Op. cit.*, ref. 34, p. 79.
52. *Op cit.*, ref. 36, p. 264.
53. *Op. cit.*, ref. 23, p. 143.
54. *Op. cit.*, ref. 27, p. 20.
55. *Op. cit.*, ref. 34, p. 369.
56. *Op. cit.*, ref. 36, p. 265.
57. Cook, J. W.: Chemistry and cancer. The Royal Institute of Chemistry of Great Britain and Ireland, London, 1943, p. 11.
58. Voegtlin, C.: Some chemical aspects of cancer problems (Herter lecture). Science 88:41-48, July 15, 1938.
59. Toennies, G.: Chemistry and cancer. Clinics 4:102-111, June 1945.
60. Crile, G. W.: The physical nature of mental processes, in Interpretations of physical education, edited by J. B. Nash. A. S. Barnes & Co., New York, 1933, Vol. IV, p. 212.
61. *Op. cit.*, ref. 60, p. 101.
62. McDonald, E.: Some chemical aspects of cancer research. J. Chemical Education 9:820-833, May 1932.
63. Fieser, L. F.: Hydrocarbon carcinogenesis, in A.A.A.S. research conference on cancer, edited by F. R. Moulton. American Association for the Advancement of Science, Washington, D. C., 1945, pp. 108-116.
64. *Op. cit.*, ref. 26, pp. 144-156, 472-473, 738.
65. *Op. cit.*, ref. 27, pp. 13-22.
66. Thannhauser, S. J.: Ueber die Kostverordnung bei Lebererkrankungen und die diätetische Behandlung der Krankheitszustände mit Hypercholesterinämie. Schweiz. med. Wchnschr. 65:1177-1181, Dec. 7, 1935.
67. Roffo, A. H.: Cancerigenic factors. J. Am. M. A. 115:70, July 6, 1940.
68. Roffo, A. H.: Role of ultra violet rays in development of cancer provoked by the sun. Lancet 1:472-474, Feb. 29, 1936, abstr., J. Am. M. A. 106:2111, June 13, 1936.
69. Roffo, A. H., and Roffo, A. E., Jr.: Sensibilidad cutánea y radiaciones solares en el cáncer de la piel; su relación con la colesterina. Presna med. argent. 22:2151-2173, Nov. 6, 1935; abstr. J. Am. M. A. 106:166, Jan. 11, 1936.
70. Cowdry, E. V., ed.: Arteriosclerosis; a survey of the problem. The Macmillan Co., New York, 1933, pp. 257, 304-305, 346.
71. *Op. cit.*, ref. 40, pp. 487-488.
72. *Op. cit.*, ref. 23, pp. 141-143.
73. *Op. cit.*, ref. 36, pp. 263-265.
74. van den Bergh, A. A. H.: Cholesterol problem. Nederl. tijdschr. v. geneesk. 76:956-966, Feb. 27, 1932.
75. Leary, T.: The relation of cholesterol to atherosclerosis, in Proceedings of the Thirty-Fourth Annual Meeting of the American Association of Pathologists and Bacteriologists. Am. J. Path. 10:702-703, May 1934.

76. Epstein, E., and Lorenz, K.: Beitrag zur Pathologie und Pathochemie der cholesterinigen Lipoidose vom Typus Bogaert—Scherer. Klin. Wchnschr. 16:1320-1323, Sept. 18, 1937.

77. *Op. cit.*, ref. 70, pp. 304, 345.

78. *Op. cit.*, ref. 27, p. 42.

79. *Op. cit.*, ref. 70, p. 345.

80. *Op. cit.*, ref. 27, pp. 56-57.

81. *Op. cit.*, ref. 27, p. 47.

82. *Op. cit.*, ref. 23, pp. 154-155.

83. *Op. cit.*, ref. 23, p. 149.

84. *Op. cit.*, ref. 70, p. 309.

85. *Op. cit.*, ref. 23, p. 156.

86. *Op. cit.*, ref. 23, pp. 155-156.

87. Bodansky, M., and Bodansky, O.: Biochemistry of disease. The Macmillan Co., New York, 1940, pp. 145-146.

88. Snapper, I.: Medical clinics on bone diseases. Interscience Publishers, Inc., New York, 1943, pp. 151, 152, 157.

89. *Op. cit.*, ref. 26, pp. 144-159.

90. *Op. cit.*, ref. 26, p. 145.

91. *Op. cit.*, ref. 26, p. 155.

92. Foot, N. C.: Pathology in surgery. J. B. Lippincott Co., 1945, pp. 49-50.

93. Oberling, C.: The riddle of cancer. Yale University Press, New Haven, Conn., 1944, p. 53.

94. Gye, W. E.: Research on cancer. J. Am. M. A. 108:652, Feb. 20, 1937.

95. *Op. cit.*, ref. 26, pp. 74-79.

96. *Op. cit.*, ref. 26, p. 249.

97. *Op. cit.*, ref. 70, p. 304.

98. *Op. cit.*, ref. 23, pp. 248-264.

99. *Op. cit.*, ref. 8, p. 175.

100. *Op. cit.*, ref. 70, p. 305.

101. Shaffer, P. A.: Fat metabolism, in Cyclopedia of medicine, surgery, and specialties. F. A. Davis Co., Philadelphia, 1940, Vol. X, p. 56.

102. *Op. cit.*, ref. 29, pp. 344, 538-539.

103. Hundley, J. W., Jr.: Histamine, revised by H. K. Mohler, in Cyclopedia of medicine, surgery, and specialties. F. A. Davis Co., Philadelphia, 1940, Vol. VII, pp. 281-286.

104. Feinberg, S. M.: Histamine and antihistaminic agents; their experimental and therapeutic status. J. Am. M. A. 132:702-713, Nov. 23, 1946.

105. Bassler, A.: Diseases of the digestive system. Ed. 3, revised. F. A. Davis Co., Philadelphia, 1928, Vol. II, pp. 225-227.

106. *Op. cit.*, ref. 10, p. 178.

107. Keeney, E. L.: Periodic vascular head pain. Clinics 5:550-567, Aug. 1946.

108. Perrott, G. St.J.: The problem of chronic disease. Psychosom. Med. 7:21-27, Jan. 1945.

109. Dorn, H. F.: Illness from cancer in the United States. Public Health Reports 59:33, Jan. 14; 65, Jan. 21; 97, Jan. 28, 1944.

110. Sherman, H. C., and Lanford, C. S.: Chemistry of food and nutrition. Ed. 5. The Macmillan Co., New York, 1939, p. 242.

111. Hopkins, B. S., *et al.*: Chemistry and you. Lyons & Carnahan Publishing Co., Chicago, 1939, pp. 326, 327.

112. Deming, H. G.: General chemistry. Ed. 4. J. Wiley & Sons, Inc., New York, 1935, pp. 243-244.

113. *Op. cit.*, ref. 112, p. 245.

114. *Op. cit.*, ref. 111, p. 326.

115. Cox, C. R.: How to "feed" fluorine. Chem. Abstracts 41:7021 1947.

116. Beckwith, T. D., and Moser, J. R.: Germicidal effectiveness of chlorine, bromine and iodine. J. Amer. Water Works Assn., 25:367-374, 1933.

117. Richardson, L. B., and Scarlett, A. J.: Brief college chemistry. Henry Holt & Co., Inc., New York, 1942, pp. 136-137.

118. *Op. cit.*, ref. 111, pp. 329-330.

119. *Op. cit.*, ref. 110, p. 252.

120. Hodges, P. C., *et. al.*: Skeletal sclerosis in chronic sodium fluoride poisoning. J. Am. M. A. 117:1938, Dec. 6, 1941.

121. Iodine Educational Bureau: Is flourine an etiological factor? Iodine Facts, World Goiter Survey, Stone House, Bishopsgate, London, April, 1946, p. 199.

122. Burwell, A. L.; Case, L. C., and Goodnight, C. H.: Fluoride removal from drinking water; small installations using virgin bone black. (Okla. Geol. Survey, Circ. No. 25, pp. 1-41, 1945), Chem. Abstracts 39:3863, 1945.

123. Dean, H. T.: Chronic endemic dental fluorosis (mottled enamel). J. Am. M. A. 107:1269-1273, Oct. 17, 1936.

124. New York State Joint Legislative Committee on Nutrition. Final Report: Meals for millions. Legislative Document No. 61, p. 11.

125. Queries and minor notes: Chlorination of water supply. J. Am. M. A. 108:1910, May 29, 1937.

126. Wilson, D. C.: Fluorine in etiology of endemic goiter. Lancet, 1:203-234, Feb. 15, 1941; abstr., J. Am. M. A. 116:2632, June 7, 1941.

127. *Op. cit.*, ref. 112, pp. 224-225.

128. *Op. cit.*, ref. 117, p. 137.

129. *Op. cit.*, ref. 112, p. 244.

130. *Op. cit.*, ref. 111, pp. 314-317.

131. *Op. cit.*, ref. 117, p. 142.

132. *Op. cit.*, ref. 111, pp. 480-481.

133. Drinker, C. K.; Warren, M. F., and Bennett, G. A.: Problem of possible systemic effects from certain chlorinated hydrocarbons. J. Ind. Hyg. & Toxicol. 19:283-311, Sept. 1937.

134. Visscher, M. B.; Carlson, A. J., and Ivy, A. C.: Water filtration versus chlorination. J. Am. M. A. 107:1910, Dec. 5, 1936.

135. Horwood, M. P.: The sanitation of water supplies. C. C. Thomas, Springfield, Ill., 1933, p. 156.

136. Instruction for installation, operation and maintenance of Wallace and Tiernan chlorine control apparatus. Pub. by Wallace and Tiernan Co., Newark, N. J., 1925, p. 10.

137. *Op. cit.*, ref. 135, p. 150.

138. *Op. cit.*, ref. 112, p. 225.

139. Department of Health, State of New York, Division of Vital Statistics: Sixty-third annual report. Legislative Document (1943) No. 73 for year ending Dec. 31, 1942. 2:15.

140. Personal communication from T. Hochlerner, Chief Engineer, Bureau of Water Supply, Department of Water Supply, Gas and Electricity, City of New York: Average [water] analysis for the year 1944.

141. New York State Department of Health: Descriptive data on public water supplies in New York State. Bulletin No. 19, 1940, pp. 3-43.

142. New York State Department of Health: Surface water supplies should always be chlorinated. Health News 23:165-166, Oct. 7, 1946.

143. Marine, D., and Kimball, O. P.: Prevention of simple goiter in man. J. Lab. & Clin. Med. 3:40-47, Oct. 1917.

144. Kimball, O. P.: Iodized salt for prophylaxis of endemic goiter. J. Am. M. A. 130:80-81, Jan. 12, 1946.

145. McClendon, J. F.: Statistical relation between goiter and cancer. Am. J. Cancer 35:554-558, April 1939.

146. U. S. Public Health Service: Endemic goiter. Public Health Bulletin No. 192, p. 13, 1929.

147. McClendon, J. F.: Iodine and the incidence of goiter. Univ. of Minn. Press, Minneapolis, 1939, pp. 59, 62, 92.

148. *Op. cit.*, ref. 146, pp. 13-14.

149. *Op. cit.*, ref. 147, p. 59.

150. Hibbard, J. S.: Experimental thyroid hyperplasia; increased intake of chloride combined with diet deficient in iodine as factor. Arch. Surg. 26:648-657, April 1933.

151. Remington, R. E.: Effect of chloride on the thyroid gland. Proc. Soc. Exper. Biol. & Med. 37:652-653, 1938.

152. Sharpless, G. R., and Anthony, E. K.: Effect of chloride with high and low iodine supply on thyroid gland of rat. J. Nutrition 25:239-243, March 1943.

153. *Op. cit.*, ref. 8, p. 193.

154. *Op. cit.*, ref. 111, pp. 330-331.

155. *Op. cit.*, ref. 110, p. 335.

156. *Op. cit.*, ref. 112, p. 258.

157. Pond, M. A., and Willard, W. R.: Emergency iodine sterilization for small samples of drinking water. J. Am. Water Works A. 29:1995-1998, 1937.

158. Renshaw, A.: Emergency method for sterilization of water. Lancet 2:237-238, Aug. 21, 1943.

159. Fair, C. M., *et al.*: Water disinfecting tablets. J. New England Water Works A. 58:270-277, 1944.

160. Little, B. C.: Sodium iodide treatment of Rochester's water supply. J. Amer. Water Works A. 12:68-86, Sept. 1924.

161. Government Services: Iodine instead of chlorine for water purification. J. Am. M. A. 132:930, Dec. 14, 1946.

162. *Op. cit.*, ref. 110, pp. 335-337.

163. MacLeod, J. J. R.: Physiology in modern practice. C. V. Mosby Co., St. Louis, 1935, pp. 764-765.

164. Editorial: Endemic goiter and iodine content of water, milk and pasture. J. Am. M. A. 108:729-730, Feb. 27, 1937.

165. *Op. cit.*, ref. 110, p. 339.

166. *Op. cit.*, ref. 163, pp. 816-826.

167. Bauer, J.: Constitution and disease; applied constitutional pathology. Ed. 2. Grune & Stratton, Inc., New York, 1945, pp. 22, 107-136, 147.

168. Braithwaite, J.: Excess of salt in diet a probable factor in the causation of cancer. Lancet 2:1578-1580, 1901.

169. Stevens, W. M.: Cancer, its causation, prevention and treatment. H. K. Lewis Co., London, 1933, p. 7.

170. Weston, W.: Iodine in nutrition. Am. J. Pub. Health 21:715-724, July 1931.

171. *Op. cit.*, ref. 170, pp. 722-723.

172. Clark, N. M.: Are we starving to death? Sat. Eve. Post 218:88-91, Sept. 1, 1945.

173. Bigelow, G. H., and Lombard, H. L.: Cancer and other chronic diseases in Massachusetts. Houghton Mifflin Co., Boston, 1933, p. 4.

Journal A.O.A.
July, 1948

Congenital Torticollis (Wryneck)*

JAMES M. EATON, D.O., F.A.C.O.S.
Philadelphia

Torticollis may be either congenital or acquired; the latter is by far the more frequent form. However, we shall limit our discussion to the congenital form.

The congenital form of torticollis may be divided into two general types: (1) Torticollis as a primary congenital deformity due to some defect of the embryo, usually associated with other congenital defects; (2) the common type of congenital torticollis, without bony defect or abnormality.

Torticollis as a primary congenital deformity is unusual and is accompanied by such defects as shortening of the sternocleidomastoid, fusion of the atlas and occiput, synostosis of the atlas and axis, or other of the cervical and upper thoracic vertebral segment, malformations of the cervical vertebrae, failure of segmentation, extra wedge-shaped vertebrae, hemivertebrae, and cervical ribs. The possibility of such abnormalities provides the basis of an inviolate rule that x-ray examination of the cervical and upper thoracic portions of the spine precede any corrective measure that might be employed.

The more common type of congenital torticollis provides a more speculative field for the investigator in his search for the cause of this deformity. Abnormal position of the head in utero, hematoma of the sternocleidomastoid, partial rupture of this muscle, and effusion of blood into the sheath are some of the more common theories advanced to explain the pathology.

The substance of the affected muscle is smaller in amount and contains an abnormal amount of fibrous tissue. Patches of scar-like tissue may be distributed throughout, or in severe cases the muscle may be largely replaced by this tissue. Other soft parts of the neck, notably the deep fascia, are adaptively shortened.

The secondary changes of the head, face, and neck are produced by the sustained position in long-continued deformity and are by far the most difficult to prognosticate. Marked asymmetry of the face and skull, and slight diminution of the size of the cerebral hemisphere on the affected side are static deformities, and may occur in other deformities causing continued one-sided position of the head.

To describe the symptoms is to describe the deformity. The chin is rotated to the opposite side and the head tilted to the affected side, the ear approximating the shoulder in a listening attitude. The head is displaced to the same side of the median line. Normal position cannot be maintained by passive manipulation, and the shortened sternocleidomastoid stands out as a cord and offers resistance to repositioning. Other motions of the head and neck, not restrained by the shortened muscle, are free.

The patient is free of pain, and the condition does not impair the general health. Lateral curvature of the spine always exists in some degree. This deformity is a secondary change, but should not be overlooked, as it may persist after the correction of the primary deformity.

*Delivered before the Orthopedics and Traumatology Teaching Sessions, Fifty-First Annual Convention of the American Osteopathic Association, Chicago, July 24, 1947.

Facial asymmetry is more noticeable when the position of the head is corrected. The eye is lower on the affected side, and the vertical length of the face is shortened on the affected side. This hemiatrophy develops as long as the position of the head remains untreated, but tends to diminish or disappear when the deformity is corrected and the blood stream becomes normal.

The diagnosis is not too difficult, but one must be positive before undertaking any operative procedure. X-ray study of the cervical and upper thoracic portions of the spine should be made to determine any anomaly. In some cases the shortened sternocleidomastoid is secondary to malformation of the cervical vertebrae.

There are several conditions from which congenital torticollis must be differentiated:

Tuberculosis of the cervical portion of the spine is the most difficult. However, in tuberculosis all muscles are in spasm, and motion is limited in all directions. X-ray findings are characteristic, and other signs of tuberculosis are usually present.

Traumatic and inflammatory torticollis may occur after exposure or injury and the head is held tilted characteristically. However, pain and stiffness are prominent and the condition clears up rapidly. X-ray studies are usually normal.

Inflamed cervical lymph glands by reflex stimuli may produce a similar deformity, but the enlarged and tender cervical lymph nodes on one side of the neck are not found in congenital torticollis.

Arthritis deformans may be differentiated by the stiffness, pain, and history. X-ray findings are characteristic.

Reflex irritation may produce deformity of head and neck as a result of otitis media or from abnormal teeth, and it may occur in the course of certain general diseases, such as scarlet fever, diphtheria, mumps, and measles.

Ocular torticollis may occur from an error in vision. In cases of doubtful origin, examination of the eyes will help.

Cicatricial contractions, from burns and other conditions, are usually evident on inspection.

Paralytic wryneck occurs in poliomyelitis from involvement of the sternocleidomastoid, but other muscles are usually involved to aid in the diagnosis.

There is no hope of improvement or cure without treatment. In children one may expect practically complete correction of both primary and secondary deformities. In the adolescent and young adult, facial asymmetry will diminish greatly after correction, but x-ray examination will usually reveal that vertebral asymmetry from growth in an abnormal position remains, and if so, full correction will not be obtained. In the adult, function will improve, but the facial and skull asymmetry will usually persist.

The milder cases are amenable to nonoperative measures, and unusually good results may be expected if the patient can be treated in infancy. If, however, after the age of 3, the deformity persists in spite of adequate conservative treatment, surgical intervention is usually necessary. Delay may "fix" the secondary

deformities and prevent complete recovery. Surgery is rarely indicated before the age of 3, and not recommended.

Manipulations should be carried out with extreme care not to use too much force. They may be carried out with the patient sitting up, or supine with the head in extension over the edge of the bed, or in the case of an infant the shoulders may be raised over several towels or folded sheets to accomplish the same position. The manipulations consist of slowly stretching and massaging the involved sternocleidomastoid, overcorrecting the existing deformity. Traction is maintained throughout the maneuvers. Again, all manipulations are carried out slowly to avoid traumatism to the musculature.

These passive exercises are carried out five or six times daily by the nurse or some responsible member of the patient's family, under the constant supervision of the attending surgeon. The surgeon must constantly check on the manipulative ability of the lay operator until he is certain the maneuvers are being carried out properly. This latter is most important and most difficult.

If the patient is old enough, active exercises are given designed to stretch the involved musculature, and to aid in the rehabilitation of the entire cervical and upper thoracic region. It has been my practice to recommend that these exercises be carried out in front of a mirror that the patient may visually align the head to its proper posture with the trunk. As an aid a vertical line is drawn on the mirror that the patient may learn to swing the head properly to the midline after each exercise. In addition, a horizontal line is also drawn on the mirror on a level with the eyes of the patient to enable him to correct the side-bend. The exercises are at first carried out with the eyes open, and then later with the eyes closed to check on the proprioceptive sense. After the maneuvers are completed, the patient then opens his eyes and checks on his ability to hold his head in its normal position without the use of the mirror. These active exercises are carried out at stipulated intervals throughout each day, at least five or six times at first, under the supervision of some responsible member of the family, or a friend, to make certain they are carried out and performed properly. Youngsters cannot be depended upon to do these exercises voluntarily or correctly, nor can most adults, for that matter, unless under supervision. The exercise periods should be given specifically, every 2 or 3 hours throughout the waking day, and for a definite number of maneuvers in each direction. Constant supervision of the physician is most essential to insure the best results. It is surprising how the most simple instructions can be misinterpreted and improperly executed, even by the most intelligent.

In the more severe cases, and those less yielding to manipulation and active exercises, manipulation and stretching under anesthesia, overcorrecting the deformity very slowly so as not to produce muscle rupture and hemorrhage, may be carried out. The correction may be accomplished in one or several stages. When correction, either partial or complete, has been obtained, this position is maintained by a plaster-of-Paris jacket which includes the head and extends at least to the thoracolumbar juncture, but preferably to the iliac crests. One warning should be given. With a child under anesthesia, and for that matter an adult, the physician must be extremely careful in applying a plaster jacket so that it will not embarrass costal and abdominal breathing.

The patient is kept in the corrected position, if not complete, for 2 weeks, and then the procedure is repeated to obtain further correction which is maintained by the plaster jacket as described previously. After full overcorrection is obtained, this position is maintained 6 to 8 weeks and, following the removal of the cast, manipulation and active exercises described previously are carried out. As a rule exercises and braces such as a Thomas collar, without previous manipulation are futile, and in general a cutting operation is advised.

It is of great importance that the manipulations and active exercises be continued for a long time; a recurrence of the deformity may take place. Constant supervision by the physician and cooperation of the patient are of equal importance. These patients cannot be neglected.

If conservative measures fail, operative treatment should be urged. As a rule operative treatment is not recommended in children under the age of 3 years, unless the deformity is extremely severe and unresponsive to conservative measures. In these cases I do not apply a cast, but follow the surgery with the manipulative treatment described previously; this must be adhered to vigorously if good results are to be expected.

The operative treatment consists of division of the sternal and clavicular heads of the involved sternocleidomastoid by an open procedure. Subcutaneous tenotomy is mentioned only to condemn the procedure; it is never justified and should never be done. Plastic lengthening of the muscle may be performed, but is only recommended in the older and exceptional case. Division of the upper end of the muscle has been advocated, but in spite of the fact that the scar can be hidden by the hair and overcorrection may be accomplished with ease, the spinal accessory nerve and the external jugular vein are too easy to damage.

It is important that both heads of the sternocleidomastoid be severed close to their bony attachments and the sheath severed transversely. It should be noted that the sheath covering the clavicular head lies over the internal jugular vein, but if the technic is carried out carefully, no serious damage will result.

In the more severe cases, particularly in the neglected adult type, division of the deep fascia of the neck, and possibly of the scalenus anticus and medius may be necessary to insure correction without strain and further injury to these muscles.

Following the division of the muscle, the deformity is overcorrected, and position maintained with the plaster jacket described previously. I would recommend that the top of the head be left uncovered by the plaster, thus avoiding pressure of the weighty cast. The cast is left in place 6 to 8 weeks, and following its removal manipulation and passive and active exercises are to be carried out as previously described. It must be impressed upon the patient and his family that the surgery and cast are only the first step in the treatment of the deformity, and that in most cases, the treatment must be continued for a year or more, under constant supervision, if recurrences are to be avoided. Failure to get the cooperation of the patient may result in recurrence.

Some form of retentive apparatus, such as a Thomas collar, may be necessary in some cases, particularly in children with ignorant and careless parents.

It is surprising that the facial asymmetry, which is characteristic of the deformity, clears up rapidly following proper correction of the torticollis; in the younger patients it may disappear entirely.

SUMMARY

The overcorrection of the deformity, correction of the spinal curvature, maintenance of correction in plaster, manipulation, active and passive exercises, and prolonged supervision and treatment are essential to success in the care of torticollis.

12 S. 12th St.

Progress in Surgery of Eye, Ear, Nose, and Throat*

CHARLES A. BLIND, D.O., F.A.C.O.S.
Los Angeles

The Lempert fenestration operation for the improvement of hearing in otosclerosis and the keratoplasty, or corneal transplant, for replacement of damaged corneal tissue by healthy tissue, are two of the most publicized operations of all time. The fenestration operation is of personal interest to many persons for nearly 70 per cent of all hearing loss is due to otosclerosis. The keratoplasty has an emotional appeal to everyone for it offers hope of restoration of sight, but fewer are personally affected.

In the conclusion of his first published article[1] describing his technic, Lempert states, "It is a delicate, highly technical surgical procedure designed to create a fenestra in the bony capsule of the external semicircular canal and to provide a mechanical means of keeping this newly created fenestra permanently open. To obtain the desired results it is essential that every step in this technic be patiently and skillfully executed in its minutest detail. To bring this operative procedure to a successful conclusion it is absolutely essential that every surgical step be performed in the exact order described. Each step in this technic is the foundation for the next step, and unless each step is concluded successfully, the next step and therefore the rest of the operation are doomed to failure."

Since this original article in 1938, Lempert has published several articles. In one of them he announces the changing of the position of the opening from the external semicircular canal to the labyrinth immediately over the utricle, and this is now the accepted position. He also, for a time, used an obturator for maintaining patency of the opening or fenestra, but the use of the obturator has been abandoned. The approach to the labyrinth is made by way of the external auditory canal and the mastoid antrum. Unfortunately, even though a high percentage of the new windows do stay open, they do not all result in restoration of normal hearing. In those cases in which satisfactory results are obtained the outcome is so gratifying as to leave no doubt that, with properly selected subjects, the procedure is justified. Nevertheless, it is hoped that a better solution will be found for the problem of otosclerosis.

Lempert has developed an operation for relief of tinnitus aurium which he has named "tympanosympathectomy."[2] This procedure may be carried out under nitrous oxide-oxygen inhalation method of anesthesia, or any other general anesthetic such as pentothal. It consists of five procedures:

1. The outer membranous third of the external auditory canal is widened to permit the introduction of the widest possible ear speculum, through which the tympanic cavity will be made readily accessible to surgical intervention.

2. The lower half of the annulus fibrosus of the tympanic membrane is disengaged from the corresponding portion of the sulcus tympanicus.

3. The disengaged lower half of the tympanic membrane is everted in order to expose to view the tympanic plexus.

4. The tympanic plexus is excised.

5. The disengaged portion of the annulus fibrosus of the tympanic membrane is reinserted into its normal position within the sulcus tympanicus.

The following results in 15 cases are noted: (1) In 3 patients the tinnitus accompanied chronic adhesive middle ear deafness; the involved middle ears were dry and the drum membranes intact, with healed perforations; in all 3 patients the tinnitus disappeared. (2) In 5 patients tinnitus occurred in the presence of almost normal hearing; the tinnitus disappeared in 3 of them; in 2 it persists. (3) In 4 patients severe tinnitus occurred in the presence of total deafness due to complete degeneration of the cochlear nerve; in 3 of these tinnitus vanished, and in 1 it persists. (4) In 3 patients tinnitus accompanied a mixed form of middle and inner ear deafness; in 1 patient the tinnitus disappeared; in 2 it remained.

The corneal transplant was first attempted experimentally in 1837, when Bigger[3] claims to have obtained success in transplanting a cornea from one animal to another of the same species. In 1838 Kissam[4] transplanted the cornea of a 6 month old pig to a human blinded by a central corneal opacity. Vision improved immediately after the operation but within 15 days the transplant became completely opaque and later absorbed. At the present time circumscribed or partial penetrating keratoplasty has offered the best permanent results. Corneal transplant can be performed at any age if methods are used which can secure the transplant in position, thus preventing the detachment of the transplant in unruly patients. Infants with corneal opacity should be operated on as early as possible. The transplant material may be obtained from human eyes which have to be enucleated for various reasons and which have normal corneas, as well as from eyes of cadavers or stillborn infants, enucleated shortly after death or the delivery. If the eyes are not to be used immediately they may be kept 2 or 3 days in Ringer's or normal salt solution at a temperature of 2 to 3 degrees above zero, Centigrade. Castroviejo[5] states that in corneal transplants improvement of technic has made it possible for a good many of those unfortunates who heretofore were doomed to permanent blindness to regain vision. Even though transplant is successful as far as staying in position and maintaining itself, the recovered sight may not be maintained for the cornea may again become opaque.

(Continued on page 609)

*Presented at the annual meeting of the American College of Osteopathic Surgeons, Los Angeles October 19-23, 1947.

THE JOURNAL OF THE
AMERICAN OSTEOPATHIC ASSOCIATION
Published monthly by the American Osteopathic Association

Publication Office, 100 S. Kenilworth Ave., Oak Park, Ill.
Editorial Office, 139 N. Clark St., Chicago 2, Ill.
Address all communications to the Chicago Office

R. E. DUFFELL, D.O. ..... Editor
KATHERINE BECKER, A.B. ..... Assistant Editor
R. C. McCAUGHAN, D.O. ..... Executive Secretary
CLAYTON N. CLARK, D.O. ..... Business Manager

EXECUTIVE COMMITTEE

PRESIDENT ..... ROBERT B. THOMAS, D.O., Huntington, W. Va.
PRESIDENT-ELECT ..... STEPHEN M. PUGH, D.O., Everett, Wash.
PAST PRESIDENT ..... JOHN P. WOOD, D.O., Birmingham, Mich.
FIRST VICE PRESIDENT ..... JOHN W. MULFORD, D.O., Cincinnati
CHAIRMAN PROFESSIONAL AFFAIRS ..... BENJAMIN F. ADAMS, D.O., West Hartford, Conn.
CHAIRMAN PUBLIC AFFAIRS ..... H. DALE PEARSON, Erie, Pa.

Subscription . . . . . Ten Dollars a year in advance

Vol. 47 July, 1948 No. 11

THE WHITE HOUSE
WASHINGTON

July 3, 1948

My dear Dr. Northup:

I am happy to convey, through you, my hearty felicitations and warmest greetings to the officers and members of the American Osteopathic Association and their distinguished guests on the occasion of the Association's fifty-second annual convention.

It is my hope that the convention will be fruitful of wise counsels and constructive action in all earnest endeavors directed toward the welfare of our people. My best wishes for a successful gathering.

Very sincerely yours,
(Signed) HARRY S. TRUMAN

Dr. George W. Northup,
American Osteopathic Association,
104 South Livingston Avenue,
Livingston, New Jersey.

SELECTIVE SERVICE ACT OF 1948
(Public Law 759—Approved June 24, 1948)

Doctors over 25 years of age are not subject to the new Draft.

The question whether doctors of medicine, dentistry, osteopathy, veterinary, optometrists, and pharmacists up to 45 years of age should be liable for the Draft was finally answered in the negative by Congress. However, the Chairman of the Senate Committee on Armed Services announced to the Senate on the final day of the session that when Congress meets in January, 1949, it will look the situation over and determine whether voluntary means has been successful or whether mandatory action must be resorted to. The expanded program of the Armed Forces will require an additional 3,300 physicians.

The President is empowered to provide for deferment of persons between 19 and 26 "whose activity in study, research, or medical, scientific, or other endeavors is found to be necessary to the maintenance of the national health, safety, or interest."

College students can have their induction postponed until the end of the academic year. The President is authorized to provide for deferment "of any category or categories of students for such periods of time as he may deem appropriate."

All male persons 18 through 25 may be required to register at any time after the effective date of the Act. However, no person without his consent may be inducted until 90 days after the effective date of the Act. Eighteen year olds may volunteer for 1 year. Persons 19 through 25 may volunteer for service in the regular Army for a period of 21 months. Ages subject to induction for 21 months' service are 19 through 25.

Generally speaking, veterans who served 12 months between September 16, 1940, and the effective date of the Act, or more than 3 months between September 16, 1940, and September 2, 1945, are exempt from training and service under the Act.

The Act expires 2 years after the effective date thereof, unless Congress shall repeal or extend it.

C. D. SWOPE, D.O.

IV. SUMMATION OF EXPERIENCE WITH INTERVERTEBRAL DISK PROBLEMS

This is the last of a series of four editorials on intervertebral disk problems. Articles by recognized authorities such as Lenhard,[1] who reported on Dandy's experiences, Barr,[2] and Love,[3] appeared in a symposium on the subject in *The Journal of Bone and Joint Surgery*, and were reviewed in the past three issues of THE JOURNAL OF THE AMERICAN OSTEOPATHIC ASSOCIATION.

In the present editorial the papers by Steindler[4] and by Inman and Saunders[5] which are a part of the symposium will be considered.

Steindler discusses three problems of a pathological nature, on the grounds that they are essentially related to the diagnosis of the herniation or degeneration of the intervertebral disk. He recites three pathological facts believed to be of significance:

1. The disc has few, if any, sensory fibers, while the neighboring capsular ligamentous structures are richly endowed with sensory elements, and all the sensory endowment comes to these fibers from branches of the posterior primary division.

2. During the process of degeneration of the disc, and as a result of it, the equilibrium between the disc and the longitudinal ligamentous system is destroyed, and this disturbance is only incompletely compensated for by arthritic ledges and buttresses. The result is that the junction between the vertebral bodies is loosened; and stress is placed, therefore, upon the supporting ligamentous and muscular system.

3. In the presence of this disturbed equilibrium, the disintegration of the disc proceeds, leading finally to herniation

1. Lenhard, R. E.: End-result study of the intervertebral disc. J. Bone & Joint Surg. 29:425-428, April 1947.

2. Barr, J. S.: Ruptured intervertebral disc and sciatic pain. J. Bone & Joint Surg. 29:429-437, April 1947.

3. Love, J. G.: The disc factor in low-back pain. J. Bone & Joint Surg. 29:438-447, April 1947.

4. Steindler, A.: An analysis and differentiation of low-back pain in relation to the disc factor. J. Bone & Surg. 29:455-460, April 1947.

5. Inman, V. T., and Saunders, J. B. de C. M.: Anatomicophysiological aspects of injuries to the intervertebral disc. J. Bone & Joint Surg. 29:461-468, April 1947.

into the spinal canal. Herniation is an evolutionary process, which shows phases in which the protrusion is still free and movable and capable of spontaneous reduction; in other phases there is fixation of the protrusion and definite adhesions to nerve trunks. It is still a question as to whether or not an acute traumatic herniation does exist,—that is, one where the sciatic radiation occurs immediately after the trauma and is not preceded by low-back pain.

Certain diagnostic implications arise from these observations. Steindler says that, first, one must prove that a disk lesion does exist; second, if it does exist that it is responsible for the radiation of pain, and last, that it produces so-called neurological signs. To arrive at a proper diagnosis the following facts are useful: " . . . a history which indicates the cause, duration, and continuity of the radiation; a neurological examination, which reveals the so-called neurological signs, including paraesthesiae, numbness, areflexia, and shrinkage; and the so-called orthopaedic signs, which disclose such things as changes in posture, rigidity, and restriction of motion."

In his opinion the diagnosis of the protruded disk should be made if neurological signs are present and if the history and other complaints substantiate it. However, in cases in which there is uncertainty, a further procedure may be carried out, as follows:

The novocain test eliminates the diagnosis of a protruded disc in those cases in which the sciatic radiation is purely a reflex phenomenon. These patients show no neurological signs, —that is, no areflexia, no paraesthesia, and no anaesthesia. The test is only applicable if a trigger point exists, because the substance of the test is that the trigger pain and the sciatic pain should completely and simultaneously disappear upon the injection of 1 per cent procaine. The test, of course, is based upon the fact that the local lesion, on the one hand, and the sciatic area, on the other hand, are anatomically entirely and completely independent of each other as far as nerve supply is concerned, since the former is supplied entirely by the posterior primary division and the latter by the anterior primary division. The result of this test must be striking in order to be evaluated. There is no middle ground. The interpretation must be very rigid. The patient must volunteer the information that pain has now completely disappeared—both locally and by radiation—and the surgeon must verify this by the disappearance of the leg-raising sign.

Steindler says that when this test is positive, it furnishes absolute proof that the pain is of reflex character and not referred, and that, therefore, a disk lesion is not present and no operation is necessary.

The last point taken up by Steindler is whether or not the lumbosacral portion of the spine should be fused after the removal of a pathological disk. He says that "Fusion should be done in all cases in which instability of the lumbosacral junction has manifested itself by prolonged and repeated attacks of backache." The removal of a disk will not relieve a backache due to local instability. "These two conditions may be related," he remarks, "but only in so far as the degeneration of the disc may be responsible both for the instability of the lumbosacral junction and for the herniation which causes the referred sciatic pain."

Steindler concludes that on the basis of the pathological findings, the best policy in all doubtful cases is to initiate a conservative trial treatment. On the other hand, where the diagnosis is certain on the grounds of clinical examination and where trial treatments fail, an operation is indicated.

Inman and Saunders[8] re-examine certain fundamental anatomicophysiological principles involved in injuries to the intervertebral disk. They emphasize the fact that the pressure of vertebral bodies on the nucleus pulposus is resisted by the inherent elasticity of the annulus fibrosus and other related ligaments of the spine, such as the ligamenta flava. They do not agree with the conception that the nucleus is an elastic cushion, absorbing shocks to the spine. Since the nucleus consists largely of water, which is incompressible and possesses no elasticity whatsoever, the elasticity of the spine is derived from the elastic resistance which the ligamentous structures exercise against deformation of the fluid content of the disk.

They point out that should the pressure tending to approximate two vertebrae exceed the osmotic pressure developed within the nucleus pulposus, fluid would be driven from the disk through the cartilaginous plate into the spongiosa of the vertebra. Should the reverse hold true, the higher osmotic pressure would draw water from the spongiosa into the interior of the intervertebral disk. With increasing age the cartilaginous plate becomes less permeable and the free exchange of water suppressed.

The arrangement of the concentric fibers of the annulus fibrosus, passing as they do in oblique and spiral directions from one vertebral body to another, leads to constant movement and eventually to wearing. Rupture of the fibers may lead to extrusion of nuclear material. With the loss of internal pressure the disk may collapse, joint spaces become narrow and the annulus fibrosus bulges laterally.

The authors point out that when the intervertebral spaces decrease in height, subluxations of the interarticular zygapophysial joints may occur and degenerative changes develop as the result of abnormal forces acting upon them.

In discussing the subject of pain, they state that there is now abundant experimental evidence to support the contention that distortion of the annulus fibrosus and related ligamentous structures of the neighboring joints is in itself the source of pain which, depending upon the level involved, may be referred to fairly specific areas of the body.

They divide pain into two essential types: "fast" and "slow." The former is characterized by being sharp and lancinating and readily localized. The latter is of a dull, aching character, not readily localized.

In clinical cases of herniation of the intervertebral disk the first symptom to appear is usually pain which is in the order of "slow" pain—a deep ache which usually radiates down the extremity in a more or less continuous path corresponding to the affected sclerotome. Later, evidence of nerve root compression, such as loss of vibratory sense and tactile discrimination, hypesthesia and hypalgesia, muscle weakness, and reflex changes may or may not occur.

The authors wonder whether or not the deep pain may be of a referred nature from the ligamentous

structures around the spine and the interference of spinal mechanics.

On the basis of experimental work and clinical observations, they divide patients with backache and radiating pain down the lower extremities into three categories:

1. Those with local signs and symptoms of injury to the vertebral ligamentous structure (These patients, they say, should be considered as suffering from mechanical derangement of the spine and should be treated by immobilization and support.)

2. Those with symptoms identical to the first group, but which, in addition, reveal definite evidence of nerve root compression (Treatment should be directed towards the relief of pressure to prevent permanent damage to the affected nerve root. However, the authors caution that the removal of a herniated or displaced disk will not affect the factors associated with ligamentous irritation, resulting in local backache and the radiation of deep pain to the extremities.)

3. Those in whom the symptoms of backache may be mild and radiation of pain to the extremities not extensive, but the signs of nerve compression are outstanding (Relatively few cases of herniated disk fall into this category, but spinal cord tumors do and surgical intervention results in dramatic relief from compression symptoms.)

NEW BOOK ON OSTEOPATHIC RESEARCH NOW AVAILABLE

Dr. Louisa Burns' newest book on osteopathic research will be available at the Boston convention. It is titled "Pathogenesis of Visceral Disease Following Vertebral Lesions" and represents nearly a half century of experimental and clinical research on the effects of vertebral lesions on viscera.

The book was published under the auspices of the Committee on Research of the American Osteopathic Association. Dr. L. C. Chandler and Dr. Ralph W. Rice of Los Angeles collaborated with Dr. Burns in the editing of the book, and the mechanical details of publishing and indexing were handled by the Editorial Department in Central office.

Dr. Chandler and Dr. S. V. Robuck, Chicago, members of the Osteopathic Research Council, wrote the Preface and Foreword respectively.

Part I of the book, comprising the first 70 pages, is a highly condensed synopsis of the general method of approach and the general principles that have grown out of the studies of Dr. Burns and her associates.

Part II, comprising the next 210 pages, recites the details of experiments and their results, involving several thousand animals and the several systems of the body. Recital of experiences with human beings is coordinated with the animal experimental work because of its practical value.

The appendixes, comprising 44 pages, contain descriptions of the methods used.

In his Preface, Dr. Chandler says, "Because of the potential bearing of this book upon human welfare, we hope that it may receive critical but open-minded study from all scientific workers who see it. . . . The reader will need to bear in mind certain other facts concerning this book if he is to approach its contents properly. It must be remembered that it was written primarily for the members of the osteopathic profession and uses their vernacular. This will make parts of it difficult to understand for many readers. Everyday experiences in the practice of the osteopathic physician are recited that will arouse questions in the minds of many others . . .

"The reader will be prepared to some extent for the thesis developed in this book, and the method of study, if he will study the recent report on 'Sludged Blood' in *Science* for November 7, 1947. Knisely, Block, *et al.*, report a 16-year study that presents a number of basic similarities to the work done by Burns . . . [They are] dealing with the production of tissue disease by a systemic blood change. The ultimate mechanism of the tissue damage is strikingly similar to that described by Burns which results from vertebral lesions without general disease.

"To be able to evaluate this writing, the reader should be familiar with the methods and criteria of biological research as illustrated in genetic and nutritional investigations. With this knowledge he will appreciate the significance of the attention to detail and the integrity with which the experimental studies have been carried out.

"The osteopathic reader should observe that this monograph makes an important contribution to the technics of osteopathic treatment by describing the responses of the tissues involved in the lesion to manipulation at different stages. It is devoted primarily, however, to summarizing the facts that have been demonstrated concerning the isolated vertebral lesion which can be produced experimentally—the so-called 'traumatic' lesion. It establishes experimentally the fact that the osteopathic lesion exerts a disease-producing influence and describes the nature of the disease process produced by this particular type of osteopathic lesion."

In the Foreword, Dr. Robuck says, "Though a few pioneers have conducted some controlled research both into the laboratory aspects and the clinical results of the application of osteopathic principles, Dr. Louisa Burns is first to devote a lifetime to this work. Inspired in 1901 by the challenge of the statement that 'no facts are available concerning these matters,' Dr. Burns set about to delve into the unexplored. Since that time she has devoted her life to the task of disclosing the truths concerning the osteopathic lesion—its pathology and its influence upon the nervous system and the organs, tissues, and movement of fluids controlled or influenced by nerve impulses, mechanical impediment, and chemical variants.

"This book will undoubtedly become more valued as years pass for its contents deal with data that are basic:

"To scientists bent on understanding more clearly those factors controlling the body's multitude of functions—electrical and chemical;

"To specialists who wish to enhance their comprehension of the forces which control their patients' bodies and their functions;

"To general practitioners who must perforce meet the needs of the greater part of the population, and deal with innumerable complex problems to give relief, restore health, and save life;

"To patients who are of necessity at the mercy of the doctors' knowledge, technical ability and wisdom;

"Covering a portion of the results of 45 years of investigation, the fruits of this scientist's life will serve as an important guide marking the research trail for others."

Every osteopathic physician will want to own a copy of this latest book of Dr. Burns. The price is $6.00 and it may be ordered from the American Osteopathic Association, 139 N. Clark St., Chicago 2, Ill.

PROGRESS FUND TOPS TWO MILLION

The Osteopathic Progress Fund passed an important milestone in its drive for $7,500,000, when it topped the $2,000,000 mark in June of this year. Although this total still leaves the program behind schedule, nevertheless it represents a professional achievement of no mean stature. In addition to the financial aspect, it represents an enormous amount of effort by many members of the profession, National and State O.P.F. committeemen, divisional society officers and trustees, district leaders, and a host of volunteer workers.

The effort to improve osteopathic educational institutions represents one of the greatest forward steps taken by the osteopathic profession. It will have, and in fact is already having, a profound effect upon all other professional activities of organized osteopathy.

It is becoming generally realized by the profession that unqualified recognition of our colleges by other colleges and universities is the key to universal recognition as a complete school of practice. Money invested by the osteopathic profession in the attainment of the highest educational standards for its colleges is the best assurance of future security in practice.

LEWIS F. CHAPMAN
O.P.F. Director

THE JOB IS NOT FINISHED*

The American Osteopathic Association has come a long way since it was organized 50 years ago with 428 members listed in the 1898-99 Directory. In this short period, osteopathy has gained recognition and practice rights throughout the United States and in several foreign countries. The privileges enjoyed today by some 11,000 osteopathic physicians came about through organized effort.

Many might think that the work and financial burden are about finished now that just recognition has been attained. The job is not finished and never will be. The work and expenses of maintaining Central office will continue to increase with the necessary growth and expansion of the A.O.A. Other branches of the healing science, much larger and established much longer than osteopathy, enjoy loyal support from a very high percentage of their members. As secure as they appear to be, they realize that their organizations must continue to function indefinitely.

As of June 1, 1948, the A.O.A. membership total was 7,997 plus 58 graduates not yet licensed. As of June 1, 1947, the total was 7,935 plus 92 unlicensed graduates. These figures represent a gain of 62 licensed A.O.A. members for the past year.

From June 1, 1944, to June 1, 1947, the average annual gain in members was 290. During that period, the dues were raised from $20.00 to $30.00. Last year, the gain was 228 below the annual average of the past few years. This retardation of membership progress occurred before the raise of annual dues to $50.00 became effective.

Here are a few more figures which are causing the Committee on Special Effort no little concern. As of June 1, 1947, 3,277 members had paid their 1947-48 dues. This year by June 1, only 2,009 had paid their 1948-49 dues. That is 1,268 behind last year. There were 5,822 unpaid dues on June 1 of this year as compared with 4,536 unpaid June 1, 1947.

Doctors, you expect your patients to pay their bills when they become due. You cannot keep up your practice if you are not paid for your services. The A.O.A. has its financial problems also. Its expenses have increased with rising costs of everything else. This is no time to forsake the organization which protects your practice rights and your existence as an osteopathic physician. We cannot believe that the idea of paying $50.00 annual dues is causing this apparent lack of support. Osteopathic physicians, as a whole, are much busier now than they were before World War II.

Your chairman reported last December that the A.O.A. had gained 167 new members since June 1, 1947. We needed only 198 more members by June 1, 1948, to reach our goal of 8,300. We are now 303 below our goal because a number of careless members failed to pay their dues even after services had been rendered.

Many of you think nothing of spending several hundred dollars more for an automobile than you did in the prewar years. You are now spending on amusements and other luxuries hundreds of dollars more than you did a few years ago.

There is a definite indication that there is some degree of protest to the added $20.00 in annual dues through the fact that so many more have not yet paid these dues as compared with a year ago. Stop and think, doctors: That increase represents a fraction over 38 cents each week. Is that out of proportion with the increased organizational expense?

The A.O.A. needs your support. Pay your dues now. What will be our membership on June 1, 1949? Your check book holds the answer.

STEPHEN B. GIBBS, D.O.

*See also Committee on Special Membership Effort, page 576.

HOSPITAL EVALUATING COMMITTEE MEETS

The Evaluating Committee of the Bureau of Hospitals of the American Osteopathic Association met in Chicago at the LaSalle Hotel on June 17-20, 1948, for the purpose of reviewing and evaluating the qualifications of osteopathic hospitals.

The Bureau of Hospitals will make its report to the Board of Trustees of the American Osteopathic Association during the annual meeting in Boston, July 14-23, when final action will be taken.

Those present at the meeting included: Drs. Floyd F. Peckham, Chicago, Chairman, Bureau of Hospitals; J. Paul Leonard, Detroit, Chairman, Inspection Committee, Bureau of Hospitals; Orel F. Martin, Coral Gables, Fla., Secretary, American College of Osteopathic Surgeons; Harry L. Collins, Chicago, Chairman, Hospitals Committee, American College of Osteopathic Surgeons; Frank R. Spencer, Columbus, Ohio, representing the American College of Osteopathic Internists; R. C. McCaughan, Executive Secretary, and Robert A. Steen, Administrative Assistant, of the American Osteopathic Association.

Among the hospital inspectors present were: Drs. J. Clark Hovis, Detroit; H. J. McAnally, Kansas City, Mo.; J. P. Schwartz, Des Moines, Iowa, and Karnig Tomajan, Boston.

During the time devoted to the evaluation and consideration of hospitals approved for residency training programs, Dr. R. McFarlane Tilley, Brooklyn, Chairman, Bureau of Professional Education and Colleges; Dr. Collin Brooke, St. Louis, Chairman, Advisory Board for Osteopathic Specialists, and Dr. H. E. Clybourne, Columbus, Ohio, Chairman, Residency Committee, Advisory Board for Osteopathic Specialists, were in attendance contributing materially to the better integration of the residency program into postgraduate training required for specialty certification.

The Hospital Registry listing registered hospitals, hospitals approved for intern training, and residency training hospitals will be published in the September JOURNAL.

NEW OSTEOPATHIC RESEARCH FILM TO BE SHOWN AT BOSTON CONVENTION

Those who attend the American Osteopathic Association convention in Boston this month will have the opportunity of viewing the newest motion picture on osteopathic research. The title of the film, which is in color and sound (the latter for exhibiting changes in heart tones), is "Heart Disease—Effects of Selected Spinal Lesions upon Function and Structure of the Heart."

This picture represents 45 years of research work by Dr. Louisa Burns of Los Angeles. It depicts the immediate and permanent effects of osteopathic lesions of the third thoracic and atlas on the hearts of rabbits and other animals, several hundred of which were used in the experiments. The picture was produced by Dr. Ralph W. Rice, Los Angeles.

Heart sounds, kymograms, and microphotographs reveal changes in the hearts as a result of experimental osteopathic lesions.

This 16 mm. film is suitable for both professional and lay education. Bookings can be arranged after September 1. A sound projection apparatus is necessary for showing the picture.

SEMINARS ON THE OSTEOPATHIC LESION CONDUCTED AT KIRKSVILLE COLLEGE

Last fall a series of biweekly seminars on the osteopathic lesion, under the direction of the Department of Physiology, was inaugurated at Kirksville College of Osteopathy and Surgery. The seminar has met every other Wednesday evening during most of the present semester and has enjoyed the participation of representatives of almost all departments, and of members of the junior and senior classes.

The purposes of the seminar on the osteopathic lesion are (1) the development of sound and modern osteopathic theory on the basis of current osteopathic research and recent advances in the biological and medical sciences, and (2) the stimulation of research. A number of fields or general topics have been selected which appear to have an important bearing on the processes and mechanisms operating in the osteopathic lesion.

After selection of his topic, a member of the seminar reviews the related literature and prepares a paper in which these advances are brought to bear on the lesion. Thorough discussion by members of the seminar follows presentation of the paper. As many seminars as required are devoted to each topic. Wherever possible the practical implications are explored, and conclusions are "tested" in the light of clinical experience.

The first series of seminars, on "The Neural Basis of the Osteopathic Lesion," was based on an article of that title which appeared in the December, 1947, issue of THE JOURNAL. The second series, led by Dr. D. E. Drucker, of the Department of Physiology, was concerned with phenomena associated with referred pain and with the physiology of trigger areas. An article by Dr. Drucker, "Referred Pain and the Osteopathic Lesion," which will appear in the August JOURNAL is a product of the seminar. An article on trigger areas is in preparation.

A third series, on the relation to the osteopathic lesion of the work of the Leningrad Institute for Experimental Medicine under the direction of A. D. Speransky, was led by Dr. M. J. Goldstein. Dr. Carl B. Umanzio, Professor of Bacteriology, conducted a seminar on the neural factors in resistance and immunity.

Seminars on the following fields are planned: Trophic functions of the nervous system; the circulation of the brain and spinal cord; the cerebrospinal fluid; receptor end organs in muscles, tendon, ligaments, and articular structures; contracture, and others. It is hoped that these will appear, from time to time, in published form and contribute to the enrichment of osteopathic theory.

IRVIN M. KORR, PH.D.

"To specialists who wish to enhance their comprehension of the forces which control their patients' bodies and their functions;

"To general practitioners who must perforce meet the needs of the greater part of the population, and deal with innumerable complex problems to give relief, restore health, and save life;

"To patients who are of necessity at the mercy of the doctors' knowledge, technical ability and wisdom;

"Covering a portion of the results of 45 years of investigation, the fruits of this scientist's life will serve as an important guide marking the research trail for others."

Every osteopathic physician will want to own a copy of this latest book of Dr. Burns. The price is $6.00 and it may be ordered from the American Osteopathic Association, 139 N. Clark St., Chicago 2, Ill.

PROGRESS FUND TOPS TWO MILLION

The Osteopathic Progress Fund passed an important milestone in its drive for $7,500,000, when it topped the $2,000,000 mark in June of this year. Although this total still leaves the program behind schedule, nevertheless it represents a professional achievement of no mean stature. In addition to the financial aspect, it represents an enormous amount of effort by many members of the profession, National and State O.P.F. committeemen, divisional society officers and trustees, district leaders, and a host of volunteer workers.

The effort to improve osteopathic educational institutions represents one of the greatest forward steps taken by the osteopathic profession. It will have, and in fact is already having, a profound effect upon all other professional activities of organized osteopathy.

It is becoming generally realized by the profession that unqualified recognition of our colleges by other colleges and universities is the key to universal recognition as a complete school of practice. Money invested by the osteopathic profession in the attainment of the highest educational standards for its colleges is the best assurance of future security in practice.

LEWIS F. CHAPMAN
O.P.F. Director

THE JOB IS NOT FINISHED*

The American Osteopathic Association has come a long way since it was organized 50 years ago with 428 members listed in the 1898-99 Directory. In this short period, osteopathy has gained recognition and practice rights throughout the United States and in several foreign countries. The privileges enjoyed today by some 11,000 osteopathic physicians came about through organized effort.

Many might think that the work and financial burden are about finished now that just recognition has been attained. The job is not finished and never will be. The work and expenses of maintaining Central office will continue to increase with the necessary growth and expansion of the A.O.A. Other branches of the healing science, much larger and established much longer than osteopathy, enjoy loyal support from a very high percentage of their members. As secure as they appear to be, they realize that their organizations must continue to function indefinitely.

As of June 1, 1948, the A.O.A. membership total was 7,997 plus 58 graduates not yet licensed. As of June 1, 1947, the total was 7,935 plus 92 unlicensed graduates. These figures represent a gain of 62 licensed A.O.A. members for the past year.

From June 1, 1944, to June 1, 1947, the average annual gain in members was 290. During that period, the dues were raised from $20.00 to $30.00. Last year, the gain was 228 below the annual average of the past few years. This retardation of membership progress occurred before the raise of annual dues to $50.00 became effective.

Here are a few more figures which are causing the Committee on Special Effort no little concern. As of June 1, 1947, 3,277 members had paid their 1947-48 dues. This year by June 1, only 2,009 had paid their 1948-49 dues. That is 1,268 behind last year. There were 5,822 unpaid dues on June 1 of this year as compared with 4,536 unpaid June 1, 1947.

Doctors, you expect your patients to pay their bills when they become due. You cannot keep up your practice if you are not paid for your services. The A.O.A. has its financial problems also. Its expenses have increased with rising costs of everything else. This is no time to forsake the organization which protects your practice rights and your existence as an osteopathic physician. We cannot believe that the idea of paying $50.00 annual dues is causing this apparent lack of support. Osteopathic physicians, as a whole, are much busier now than they were before World War II.

Your chairman reported last December that the A.O.A. had gained 167 new members since June 1, 1947. We needed only 198 more members by June 1, 1948, to reach our goal of 8,300. We are now 303 below our goal because a number of careless members failed to pay their dues even after services had been rendered.

Many of you think nothing of spending several hundred dollars more for an automobile than you did in the prewar years. You are now spending on amusements and other luxuries hundreds of dollars more than you did a few years ago.

There is a definite indication that there is some degree of protest to the added $20.00 in annual dues through the fact that so many more have not yet paid these dues as compared with a year ago. Stop and think, doctors: That increase represents a fraction over 38 cents each week. Is that out of proportion with the increased organizational expense?

The A.O.A. needs your support. Pay your dues now. What will be our membership on June 1, 1949? Your check book holds the answer.

STEPHEN B. GIBBS, D.O.

*See also Committee on Special Membership Effort, page 576.

HOSPITAL EVALUATING COMMITTEE MEETS

The Evaluating Committee of the Bureau of Hospitals of the American Osteopathic Association met in Chicago at the LaSalle Hotel on June 17-20, 1948, for the purpose of reviewing and evaluating the qualifications of osteopathic hospitals.

The Bureau of Hospitals will make its report to the Board of Trustees of the American Osteopathic Association during the annual meeting in Boston, July 14-23, when final action will be taken.

Those present at the meeting included: Drs. Floyd F. Peckham, Chicago, Chairman, Bureau of Hospitals; J. Paul Leonard, Detroit, Chairman, Inspection Committee, Bureau of Hospitals; Orel F. Martin, Coral Gables, Fla., Secretary, American College of Osteopathic Surgeons; Harry L. Collins, Chicago, Chairman, Hospitals Committee, American College of Osteopathic Surgeons; Frank R. Spencer, Columbus, Ohio, representing the American College of Osteopathic Internists; R. C. McCaughan, Executive Secretary, and Robert A. Steen, Administrative Assistant, of the American Osteopathic Association.

Among the hospital inspectors present were: Drs. J. Clark Hovis, Detroit; H. J. McAnally, Kansas City, Mo.; J. P. Schwartz, Des Moines, Iowa, and Karnig Tomajan, Boston.

During the time devoted to the evaluation and consideration of hospitals approved for residency training programs, Dr. R. McFarlane Tilley, Brooklyn, Chairman, Bureau of Professional Education and Colleges; Dr. Collin Brooke, St. Louis, Chairman, Advisory Board for Osteopathic Specialists, and Dr. H. E. Clybourne, Columbus, Ohio, Chairman, Residency Committee, Advisory Board for Osteopathic Specialists, were in attendance contributing materially to the better integration of the residency program into postgraduate training required for specialty certification.

The Hospital Registry listing registered hospitals, hospitals approved for intern training, and residency training hospitals will be published in the September JOURNAL.

NEW OSTEOPATHIC RESEARCH FILM TO BE SHOWN AT BOSTON CONVENTION

Those who attend the American Osteopathic Association convention in Boston this month will have the opportunity of viewing the newest motion picture on osteopathic research. The title of the film, which is in color and sound (the latter for exhibiting changes in heart tones), is "Heart Disease—Effects of Selected Spinal Lesions upon Function and Structure of the Heart."

This picture represents 45 years of research work by Dr. Louisa Burns of Los Angeles. It depicts the immediate and permanent effects of osteopathic lesions of the third thoracic and atlas on the hearts of rabbits and other animals, several hundred of which were used in the experiments. The picture was produced by Dr. Ralph W. Rice, Los Angeles.

Heart sounds, kymograms, and microphotographs reveal changes in the hearts as a result of experimental osteopathic lesions.

This 16 mm. film is suitable for both professional and lay education. Bookings can be arranged after September 1. A sound projection apparatus is necessary for showing the picture.

SEMINARS ON THE OSTEOPATHIC LESION CONDUCTED AT KIRKSVILLE COLLEGE

Last fall a series of biweekly seminars on the osteopathic lesion, under the direction of the Department of Physiology, was inaugurated at Kirksville College of Osteopathy and Surgery. The seminar has met every other Wednesday evening during most of the present semester and has enjoyed the participation of representatives of almost all departments, and of members of the junior and senior classes.

The purposes of the seminar on the osteopathic lesion are (1) the development of sound and modern osteopathic theory on the basis of current osteopathic research and recent advances in the biological and medical sciences, and (2) the stimulation of research. A number of fields or general topics have been selected which appear to have an important bearing on the processes and mechanisms operating in the osteopathic lesion.

After selection of his topic, a member of the seminar reviews the related literature and prepares a paper in which these advances are brought to bear on the lesion. Thorough discussion by members of the seminar follows presentation of the paper. As many seminars as required are devoted to each topic. Wherever possible the practical implications are explored, and conclusions are "tested" in the light of clinical experience.

The first series of seminars, on "The Neural Basis of the Osteopathic Lesion," was based on an article of that title which appeared in the December, 1947, issue of THE JOURNAL. The second series, led by Dr. D. E. Drucker, of the Department of Physiology, was concerned with phenomena associated with referred pain and with the physiology of trigger areas. An article by Dr. Drucker, "Referred Pain and the Osteopathic Lesion," which will appear in the August JOURNAL is a product of the seminar. An article on trigger areas is in preparation.

A third series, on the relation to the osteopathic lesion of the work of the Leningrad Institute for Experimental Medicine under the direction of A. D. Speransky, was led by Dr. M. J. Goldstein. Dr. Carl B. Umanzio, Professor of Bacteriology, conducted a seminar on the neural factors in resistance and immunity.

Seminars on the following fields are planned: Trophic functions of the nervous system; the circulation of the brain and spinal cord; the cerebrospinal fluid; receptor end organs in muscles, tendon, ligaments, and articular structures; contracture, and others. It is hoped that these will appear, from time to time, in published form and contribute to the enrichment of osteopathic theory.

IRVIN M. KORR, PH.D.

COMMITTEE ON SPECIAL MEMBERSHIP EFFORT

STEPHEN B. GIBBS, D.O.
Chairman
Coral Gables, Florida

MEMBERSHIP REPORT AS OF JUNE 1, 1948

Membership count, May 1, 1948		7,972
Applications received in May, 1948	27	
Graduates licensed in May, 1948	5	
Restored to roll, May, 1948	1	
	33	
Deaths and Resignations in May, 1948	8	
Gain in May, 1948		25
Membership Count, June 1, 1948		7,997

HONOR ROLL

Dr. Hazel G. Axtell	Dr. Dorothy J. Marsh
Dr. C. H. Baker	Dr. Robert D. McCullough
Dr. Harry A. Barquist	Dr. Robert E. Morgan
Dr. R. P. Bates	Dr. C. A. Povlovich
Dr. E. J. Elton	Dr. Charles W. Sauter
Dr. Stephen B. Gibbs	Dr. Walter Siehl
Dr. J. Walter Larkin	Dr. Vernon F. Still
Dr. Alexander Levitt	Dr. Ralph Thomas
Dr. Chester D. Losee	Dr. Alex B. Wilcox

Department of Public Relations

CHESTER D. SWOPE, D.O.
Chairman
Washington, D. C.

OSTEOPATHIC APPOINTEES IN VA

Dr. John A. Cifala, Arlington, Va., was appointed in May, 1948, in the Medical Service, Associate Grade, part time, and assigned to the VA Regional Office in Washington, D. C.

Dr. Herbert R. Moskow, Philadelphia, was appointed in June, 1948, in the Medical Service, Associate Grade, full time, and assigned to the VA Regional Office in Philadelphia.

JOINT RESEARCH PROGRAM IN MEDICINE AND PHYSICAL SCIENCES ANNOUNCED BY THE U. S. ATOMIC ENERGY COMMISSION AND THE OFFICE OF NAVAL RESEARCH.

The United States Atomic Energy Commission and the Office of Naval Research have agreed upon a program of joint support of fundamental scientific research in physical and medical fields in which the two agencies have a common interest.

AEC will make available up to $3,000,000 for physical research and $1,000,000 for medical and biological research for a 1-year joint program. This will make possible the extension of the present ONR projects in fields related to the national atomic energy program and the initiation of some new projects.

Nearly 750 ONR research projects, started at 130 institutions during the 2 years of operation of ONR, are being studied with a view to their possible selection for extension or intensification through joint sponsorship. Twenty-nine medical and biological research contracts, including cancer studies, have been selected for support entirely by AEC funds. About thirty projects in nuclear physics have been tentatively approved by AEC for joint support. All contracts selected under the joint program for AEC partial or entire financing will be administered by ONR. The extension of an existing project in this cooperative program will, of course, be subject to the approval of the present contractor.

The work involved is unclassified, and is done in non-governmental laboratories, hospitals, universities, and other research institutions. The cooperative program will insure coordination of research in fields in which there is a serious shortage of qualified scientific personnel.

The physical science projects cover a wide range of investigations of a fundamental nature in nuclear and general physics, chemistry, metallurgy and ceramics, mathematics, and geophysics.

Funds for the support of the AEC-ONR research on cancer are included in the Commission's recently announced cancer research program, undertaken with Congressional authorization.

TROPICAL MEDICINE AND MALARIA

The Fourth International Congresses on Tropical Medicine and Malaria consisting of official delegations from some sixty nations met in Washington, D. C., on May 10-18, under the sponsorship of the Department of State. The Congresses seek to make widely available the new knowledge and methods for controlling disease throughout the warmer regions of the world.

The following quotations are taken from abstracts of papers presented during the Congresses:

Recent Advances in Fundamental Knowledge of Tuberculosis—"Significant additions to our understanding of the epidemiology of tuberculosis are new appreciation of the frequency of spontaneous healing of pulmonary lesions of minimal extent, as made evident by mass X-ray surveys, and an improved correlation of the time of tuberculous infection with that of development of the disease. The first 2 years after first infection in adults are recognized as a period of special hazard. The general postponement of first infection is one factor, at least, in the current shift of tuberculosis mortality toward the latter years of life."

The Treatment of Syphilis with Penicillin—"Materials on the treatment of syphilis with penicillin presented in this paper are drawn from two sources:

"1. The rapid treatment centers cooperating with the United States Public Health Service in a program for the evaluation of syphilis-treatment schedules.

"2. Materials assembled by the Central Statistical unit of the Syphilis Study Section of the Public Health Service, Division of Research Grants and Fellowships. These evaluations have been in progress since 1944 and are directed chiefly to the study of treatment results in primary and secondary syphilis.

"The following conclusions would appear to be justified on the basis of material available to date:

"1. Type of penicillin:
   a. Crystalline penicillin G is shown to be more effective than amorphous penicillin.
   b. Penicillin in oil and beeswax is at least as effective as aqueous penicillin.

"2. Duration of Treatment: Relatively little difference is noted between 4 and 8-day schedules, but 4-day schedules are considerably more effective than schedules with a total duration of 30 hours or less. This indicates the danger in shortening the total duration of therapy beyond a certain point.

"3. Intervals between injection: Relatively little difference is noted between injections given at intervals of 2 and at intervals of 3 hours.

"4. Penicillin in combination with arsenoxide or fever therapy: Although the addition of arsenoxide or fever therapy to treatment of penicillin does improve the results obtained, it is questionable whether the difference is large enough to justify the risk involved in using arsenoxide and/or fever therapy."

Modern Laboratory Methods in the Control of Enteric Fevers—"Recent advances in the laboratory control of enteric carriers seem to make it possible in time to eradicate completely the enteric fevers. The new developments in laboratory technique that have provided the weapons to fight the chronic carrier are:

"1. The introduction of refined culture media for the isolation of typhoid and paratyphoid bacilli;

"2. The Vi-agglutination test as an aid to the detection of chronic typhoid and paratyphoid-B carriers;

"3. The typing of typhoid and paratyphoid-B bacilli with the Vi bacteriophage."

(Continued on page 611)